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ABSTRACT

This study of public access databases in vocational education and training was conducted in the European Economic Community (EEC). Principal sources for the study were a survey sent to practitioners in eight countries; country studies on France, Greece, Italy, and the United Kingdom; and field work involving visits to Belgium, the Netherlands, West Germany, Ireland, and Spain. About 40 databases and information services in 9 EEC countries were investigated, many of which are both accessible to the public and are also processed electronically. The study found that the content of the databases includes description of qualifiers, university courses and courses leading to qualifications, short courses, training institutions and training resources, career guidance and details of occupations, open learning materials, legislation on vocational education and training, and funding available for training. It also found that public access databases typically need substantial funding and are nearly always supported by public funding. Nevertheless, information provided was fragmented, there was no common pattern of database sponsors and operators, and database operators were isolated from each other. The study also described the main aspects of computerized databases in the context of their content and target clients, the design features of databases, the main issues relating to the demand for training information, and the transfer of information among databases. A possible strategy for the EEC was suggested. (Appendices list the databases visited and provide a glossary of terms and acronyms.) (KC)

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Data bases in vocational education and training

The European scene

European Centre for the Development of Vocational Training

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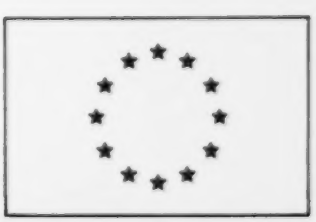

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The European scene

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Collaborating organizations: Dioikema, Guildford Educational Services Ltd, MARIS-NET (Ely) Ltd

With contibutions from: Centre Inffo, ECCTIS

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with contributions from

Centre Inffo

ECCTIS

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October 1987

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CEDEFOP PREFACE

CEDEFOP is very pleased to be able to publish the report prepared by Club D, with funding from the Directorate-General for Social Affairs, Employment and Education of the Commission of the European Community, the Manpower Services Commission in the United Kingdom, and the Ministry of Labour in Italy, on "Databases in vocational education and training".

This report provides the necessary information for consideration of this theme by the providers and the users of databases, and for future decisions, which will need to be made at both national and European Community level.

If greater mobility of students and trainees is to be achieved, the easy availability of accurate, comprehensive and up-to-date information on vocational education and training opportunities is essential. A common strategy in the development of national databases so as to ensure easy access to them also from other Community Member States is necessary, and there may be a need for Community level initiatives in this regard.

To underpin this mobility, there will also be a necessity for greater information about the vocational training systems of Member States, and here too the development of databases can play an important role. Policy-makers and researchers, but also vocational training practitioners will need to have easy access to information about the most recent developments and publications in other Member States.

Through the creation of its documentary information network and its other information activities, CEDEFOP is contributing to this process of Community level exchange. However there remains much to be done, and doing this efficiently and effectively requires the cooperation of partners at many levels, and in particular requires that the prospective users and the providers of databases have an effective dialogue.

Corrado Politi
Deputy Director

Berlin, 23 March 1988

Databases in Vocational Education and Training

The European Scene

Summary

Chapter 1: The project (pages 3-6)

A study of public access databases in vocational education and training (VET) was conducted in the European Economic Community on behalf of Club D, an informal grouping of database practitioners in Italy (Dioikema) and the UK (ECCTIS, Guildford Educational Services Ltd, MARIS-NET (Ely) Ltd), with contributions from Centre Inffo in France. Funding for the study was provided by DG V of the European Commission, the Italian Ministry of Labour, and the Manpower Services Commission in the UK.

Principal sources for the study were:

* a postal survey sent to practitioners in eight countries
* country studies on France, Greece, Italy and UK
* fieldwork involving visits to Belgium, Netherlands, Federal Republic of Germany, Ireland and Spain.

About forty databases and information services in nine EEC countries were investigated, many of which are both accessible to the public and also are processed electronically. The content of the databases includes:

* description of qualifications
* university courses and courses leading to qualifications
* short courses
* training institutions and training resources
* careers guidance and details of occupations
* open learning materials for training, teaching and learning
* legislation on vocational education and training
* funding available for training.

Part 2 of the report will contain the country studies and more information on individual databases.

Chapter 2: National approaches (pages 7-13)

Public access databases typically need substantial funding and nearly always supported (directly or indirectly) by public funding. Nevertheless it was found that almost without exception

* information provision was fragmented
* there was no common pattern of database sponsors and operators
* the database operators were isolated from each other.

The causes of fragmentation are explained, and the problems of isolation discussed. Financial options - ranging from making information on VET totally free of charge to the principle of full cost recovery - are discussed.

Chapter 3: . Databases in context (pages 14-20)

Computer technology brings significant advantages, especially if the user is also the database operator:

* handling complexity
* speed
* inputting data once only
* blending data from different sources
* holding data in more 'dimensions' than on paper
* potentially large savings in staff time.

However new administrative procedures are required to deal with:

* data maintenance
* indexing
* vulnerability of data
* data protection obligations

The databases studied varied in ways that often reflected how they had been initiated and/or funded. They also varied on dimensions such as volatility, urgency, size of database, size of record, interactivity and the nature of the target clients.

Chapter 4: Features of databases (pages 21-32)

The size of a database depends on the number of records and the size of each record. The total size of a database determines its inertia (how difficult and expensive it is to change) which is highly relevant to the possible harmonisation of databases in diffferent countries.

A wide range of hardware and software was in use in EEC countries. The only common theme was the widespread adoption of IBM PC and compatible equipment.

Data collection techniques vary widely; two principles found general support among EEC database operators:

* The system for collecting data should be appropriate to the provenance of the data, its nature and the intended layout of presentation and mode(s) of access.

* Original sources of data should not be required to supply data, nor to verify its accuracy, more than once.

The following indexing systems are distinguished:

* classification systems
* keyword or 'preferred term' indexing
* free text indexing
* use of a full thesaurus.

The classical type of thesaurus (hierarchy of broader, narrower and related terms) is most suited to bibliographic databases. The content of a VET database may dictate conflicting versions of such hierarchies, and the clients may have preconceptions of their own. In most European languages there are also ambiguities. Artificial intelligence may offer a way of resolving such problems and making the database more client-centred.

Access arrangements are discussed in four categories:

* on-line (e.g. viewdata)
* off-line (print, floppy disc, WORM, microfiche, CD-ROM)
* mediated (by a human being)
* hybrid (e.g. CD-ROM with Softstrip, CD-ROM with Datacast)

(Note: WORM: Write once read mostly optical disc
CD-ROM: Compact disc - read only memory).

Interest has developed in self-service systems and the Training Access Points initiative in the UK has identified a number of important design features.

Chapter 5: The demand for information (pages 33-55)

The demand for information is from various market segments:

* decision-makers in government departments and agencies
* training professionals
* managers of SMEs
* teachers and careers guidance staff
* individuals

Some of the demand is highly seasonal, with both SIEP and ECCTIS reporting peak demand in August/September. This pattern has implications for delivery systems. There is also evidence that demand for information is price sensitive.

Demand in different circumstances is illustrated by five case studies:

A:	BIBB Medienbank: a training materials database	(page 41)
B:	Centre Inffo: survey of the nature of the demand	(page 44)
C:	Dioikema: research on potential users	(page 49)
D:	ECCTIS: demand for on-line data	(page 51)
E:	Weiterbildungsdatenbank: course information for adults	(page 53)

Chapter 6: Communication between databases (pages 56-59)

Overwhelmingly, information is transferred between databases off-line, for example by:

* microcomputer floppy disc
* CD-ROM
* Softstrip
* WORM

In the course of the project, data and software was taken by field workers on IBM PC format floppy discs to various countries where it worked immediately, as did software which retrieved data from CD-ROM.

The huge capacity (600 megabytes) of the CD-ROM makes it easy to combine different databases, creating the opportunity for search software that allows the user to search 'seamlessly' i.e. without being aware of the joins between the databases.

Language differences create problems in software transfer, both because of inexact translations and the use of accents and (in the case of Greek) a different script. A multi-lingual dictionary, providing meanings and also examples of each term in context, would be a major asset. If such a dictionary were commissioned, it (or relevant sub-sets) could also be pressed onto a CD-ROM containing databases, greatly assisting the international use of such data.

Software should take account of different approaches to accents as an extension of spelling tolerance. There is also a problem over language length (with implications for screen layout and storage requirements) when data is translated.

Chapter 7: An EEC strategy for databases in vocational education and training
(pages 60-62)

There is a case for an EEC strategy on VET databases to cover:

* use of databases for research and decision-making
* exchange of data
* exchange of experience
* convergence/co-ordination.

There is already a wealth of data in national databases which could be tapped for research and decision-making purposes in the EEC, but projects would be required to identify gaps, arrange for them to be filled, determine a common structure and feed information to decision-makers.

Exchange of data on VET opportunities might next be tackled off-line, but a trans-national approach to indexing and classification would ease searching.

Three mechanisms are proposed for the exchange of experience:

* occasional conferences
* development of an electronic communication network
* a modified Club D for VET database practitioners.

The enthusiasm of database operators for trans-national collaboration suggests that quite modest funding could have a disproportionate impact in achieving a European information system for VET.

October 1987

DATABASES IN VOCATIONAL EDUCATION AND TRAINING

Part 1: The European Scene

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Chapter 1: The project

Aims

1.1 This study of public access databases in vocational education and training was undertaken during 1987 with funding from DG V of the European Commission, with financial contributions by the Manpower Services Commission in the UK and the Italian Ministry of Labour.

1.2 The project aims included:

* a detailed study of information systems on the availability of high-level training facilities (including non-electronic ones) in EEC member countries;

* a study of the common features and the differences between the databases already implemented or those that are currently being developed: the areas of interest (university courses, vocational training courses, institutions, experts), methods by which topics are classified, records, methods of distribution and the users of each database. This will lead to the possibility of elaborating common strategies aiming at a progressive connection of the databases;

* a study of the technical possibilities of a permanent linkage between the databases considered;

* an evaluation of the possibility of linking this initiative to those currently carried out by the EEC;

* a study of the actual and potential market for national and Community-level databases on training facilities. In the countries in which databases on training are actually operating, the composition of users and future developments would be studied;

* the formulation of a proposal aiming at creating a European network of databases on the supply of high-level training facilities.

Methodology

1.3 The project was undertaken on behalf of Club D, an informal grouping of database practitioners in Italy (Dioikema) and the UK (ECCTIS, Guildford Educational Services Ltd, MARIS-NET (Ely) Ltd), with contributions from Centre Inffo in France. The main contractor to the EEC was Dioikema of Bologna and the main sub-contractor in the UK was Guildford Educational Services Ltd (GES). The project involved:

* a postal survey, using a questionnaire designed by Dioikema; about 50 copies of the questionnaire form were sent to addressees in 8 countries, but only some 15 responses were received

* country studies on 'home ground' as follows:

France	-	Centre Inffo
Greece	-	Centre Inffo
Italy	-	Dioikema
UK	-	GES

* fieldwork involving visits to databases in

  - Belgium, Netherlands and part of the Federal Republic of Germany (Jacquetta Megarry and John Twining of GES)

  - part of the Federal Republic of Germany (Claudio Dondi and Lilia Infelise of Dioikema)

  - Ireland (Tony McCormack of Maris-Net (Ely) Ltd)

  - Spain (Claudio Dondi of Dioikema)

* analysis and synthesis of the country studies and fieldwork, leading to the drafting of the project report; this was undertaken by Dioikema and GES with contributions from ECCTIS

* preparation of the final report by John Twining, with editing by Jacquetta Megarry.

Coverage

1.4 Appendix 1 details the fieldwork, and lists the databases and other organisations visited or included in the 'home ground' country studies.

1.5 The project funding enabled some 40 databases and information services in nine EEC countries to be investigated. This figure conceals anomalies in the definition of what constitutes a 'database' or 'information service'. For example, in the UK GES manages three separate databases for three different sponsoring bodies, but in Italy the information covered by these GES databases is handled as three files in the Dioikema database. Information services which have recently introduced a computer as a tool, such as SIEP in Belgium, are likely to cover a wider range of types of information than databases which were computerised from their inception (e.g. ECCTIS in the UK). Throughout this report, unless the context demands otherwise, the term 'database' is used to include 'information service'.

1.6 It was originally planned to include only databases in the field of vocational education and training which can be accessed by the public and are processed electronically. However, because of the widely differing stages of development in the different Member States of the EEC, in some cases it has been thought advisable to include

* databases which are available to the public, are not yet processed electronically but may be converted in the fairly near future;

* databases which are processed electronically but are not yet available to the general public but to which the public, or at least particular sections (e.g. professional careers advisers), might be given access.

Databases or information systems which are not available to the public have not been included in the main survey, but there is textual reference to a few where they provide interesting examples.

1.7 The content covered by the databases surveyed includes

- descriptions of qualifications
- courses leading to qualifications
- university courses
- short courses
- training institutions, and organisations with the capability of providing training
- training resources
- careers guidance and details of occupations
- open learning materials
- training and teaching materials
- legislation on vocational education and training (including employees' legal rights).
- funding available for training.

1.8 The survey did not aim to cover bibliographic databases or those for manpower statistics, although some have been included because they illustrated a particular point. For example, MARIS-NET in the UK includes in its public access on-line system an open learning bibliography. To provide a contrast to this a visit was made to the distance learning bibliographic database at the FernUniversitat at Hagen in West Germany. Mention is made (in Chapter 6) of two databases involving manpower statistics in West Germany and the UK as both illustrate the way in which data can be transferred from one database to another for more detailed analysis.

1.9 The survey did not specifically focus on information about equivalence of qualifications or of entry requirements to higher education. However, sufficient information was gained to conclude in Chapter 7 that equivalence issues at EEC level might be tackled by using information already available in national databases.

1.10 The survey did not attempt the impossible goal of being fully comprehensive. Publications are available which give details of 74 information services in the Federal Republic of Germany and 107 in Spain, to mention only two examples. However, many of these appear to be bibliographic, and not all are computerised or accessible to the public. In the UK in particular, there are so many public-access computerised databases that only a selection has been included to give a broad coverage of different content and approaches.

1.11 Comprehensive information about databases is unattainable. Microcomputers are now so powerful, can have such large memories and are so relatively cheap that almost any organisation or institution can set up a database. Not all of these will last. Some will quickly die, and others may take their place. The creation and maintenance of computerised databases is thus a growth industry. It is therefore desirable (if only to prevent newcomers wasting efforts to re-invent what has already been undertaken) to make available a fully comprehensive picture of the information scene in vocational education and training. Some of the proposals in Chapter 7 may help to create a core of knowledge about databases in this field.

The report

1.12 The rest of this report is laid out as follows:

Chapter 2: provides a synthesis of the different national approaches to the provision of information on training.

Chapter 3: covers the main aspects of computerised databases in the context of their content and target clients.

Chapter 4: describes the consequent design features of databases.

Chapter 5: describes the main issues relating to the demand for training information, with a number of annexes providing illustrative case studies.

Chapter 6: deals with the transfer of information between databases.

Chapter 7: suggests a possible strategy for the EEC.

Tables and appendices provide additional supporting material. Appendix 1 was mentioned in paragraph 1.4. Appendix 2 gives conversion factors between ecus and national currencies. Expansions of acronyms and a glossary of technical terms are provided on grey paper as Appendix 3.

1.13 Statements made in the report are the responsibility of its writers and should not be taken as official statements of policy by the funding agencies for this study or of any database sponsor or operator.

1.14 A separate Part 2 of this report, to be completed by the end of December 1987, covers country studies of

* Belgium
* Federal Republic of Germany
* France
* Greece
* Ireland
* Italy
* The Netherlands
* Spain
* UK

Each of the country studies will contain a brief note on those aspects of the educational and training system of that country which help to explain the way in which databases developed, as well as more information on individual databases.

Acknowledgements

1.15 The writers of the report gratefully acknowledge the contributions of Centre Inffo, ECCTIS and MARIS-NET. They are indebted to Jimmy Miller and Susan Wilson for help with translating source documents and to Blue Stevens for her efficient word-processing. Dioikema, GES and MARIS-NET are grateful to all those who welcomed the field workers and provided them with the information on which this report is based.

Chapter 2: National approaches

Introduction

2.1 Anyone with a powerful microcomputer can set up and run a small database. However, both the development of a large one and the provision of public access to a small one need considerable development and maintenance funding. In vocational education and training, such funding almost always has to be from public sector ministries or agencies, which may indeed set up databases themselves.

2.2 It might be expected that public sector intervention would lead to co-ordinated national strategies for the provision of information. However, almost without exception,

* information provision was fragmented
* there was no common pattern of database sponsors and operators
* the database operators were isolated from each other.

Fragmentation

2.3 The extent of fragmentation is seen more clearly when databases are looked at from the viewpoint of their clients. Clients for information (whether they be training professionals, advisors or other intermediaries, managers of an enterprise or individuals) are unlikely to be concerned whether what they want is classified as education or training, nor whether it is a national, regional or local responsibility. The client's need is for information, often accompanied by advice tailored to a particular need.

2.4 It is possible to draw up an approximate model of a comprehensive set of vocational education and training data which might well be provided in a co-ordinated fashion. For example, a client - whether a school leaver, or an adult wishing to change career or re-enter the labour market after a period of absence - might wish to have information on

a) occupations

b) projections of approximate demand for people in those occupations

c) the qualifications needed for entry to, or otherwise associated with, such occupations

d) the detailed requirements of such qualifications

e) the institutions at which courses leading to such occupations could be studied, together with any entry requirements for such courses

f) any open learning materials, (either supported or unsupported self-study)

g) teaching material, learning material or text-books suitable for the courses

h) any financial support which might be available

i) legislation or other statements of legal rights of the individual.

2.5 An employer, or a training officer on behalf of an employer, might well need much of the same information, but also would need listings of training institutions, organisations and consultants, together with information on their main specialisations and expertise, and details of who to contact.

2.6 In no country is such comprehensive information yet available at a single point of access. The main reason is that funders of databases are constrained by the limits of their responsibilities, e.g.

* responsibility may be confined to education and may not include training, or vice versa

* implementation of education and training may be regional with central government having co-ordinating or highly specific roles.

* in the case of Belgium, a further division is between the French-speaking and the Flemish-speaking communities.

2.7 In most countries, therefore, the databases have been established within the framework of differing responsibilities of funding agencies. Often, these funding agencies have developed or commissioned a database as a by-product of a main initiative. For example

* in the UK the ECCTIS database is only part (although a major part) of an educational policy which encourages credit transfer between major post-school institutions; the MARIS database was started as an offshoot of the Open Tech programme; and the PICKUP Training Directory is just one aspect of the Department of Education and Science's PICKUP (Professional, Industrial and Commercial Updating) programme; the Further Education Curriculum database in the UK was originally commissioned by the Further Education Unit as a means of monitoring developments.

* in the Netherlands the information service at the University of Leiden, and in Belgium the Centre d'information et de documentation sur les etudes et les professions (CID) at the Catholic University of Louvain-la-Neuve, are developments which originally started as internal services for students of those universities only but are now open to the public.

* in West Germany and Spain, databases have developed or are developing inside national employment agencies (Bundesanstelt fur Arbeit and INEM) which are already collecting information about training opportunities. This has not prevented other government bodies or private agencies from running separate and relevant databaes in the field. For example, the Medienbank of the Bundesinstitut fur Berufsbildung (BIBB) (related to BIBB's responsibilities for the 'dual system' of training) is a database of training materials, and the Weiterbildungsdatenbank is a database of courses available in Berlin (an aspect of the Berlin Senate's 'qualification offensive'); neither has any direct contact with the Bundesanstalt fur Arbeit.

* in Belgium, the CENDIS bibliographic database at the Universite Libre de Bruxelles receives government funding as part of a programme to provide the long-term unemployed with work of value to the community as a whole.

2.8 In France, Centre Inffo has, for a number of years, run a central information service about training opportunities throughout the country. However, this is not tied in with national information on career opportunities. Because of devolution to the regions, pilot schemes are now being run to develop a model which combines national and regional elements and responsibilities. The Centre Inffo case study on demand (page 44) emphasises the need for co-ordination of information provision.

2.9 In West Germany the Bundesanstalt fur Arbeit operates four databases:

* training courses at all levels and in all fields (50 000 courses)
* bibliography on subjects related to labour (8000 articles)
* papers edited by the Bundesanstalt fur Arbeit (157 papers)
* bibliography of literature on research projects.

However these are not currently available for integrated access.

2.10 In the Netherlands, although the government was interested in providing an information service, it delayed doing so with the result that a number of separate initiatives were taken by Vondst BV, the Institute for Curriculum Development at Enschede, the University of Leiden and CEDEO. This earlier fragmentation is being replaced by a major initiative funded jointly by four ministries. The project is now at the pilot stage and is initially concentrating on some aspects of careers guidance (university courses and the professions to which they can lead), aiming at pupils in the last two years of school. Therefore it will not offer a comprehensive approach to training information, at least for some years. However, if the pilot is judged to be successful, the infrastructure will have been created on which such a comprehensive approach could be built.

2.11 In Italy the project of creating a database on vocational education and training was undertaken by Dioikema, a private company which received support from some public authorities. As the project went on, it became the leading national initiative in this field and was recognised by the government. The Dioikema database is very comprehensive, with seven existing files on courses, training institutions, university faculties, university teachers, training modules, teaching materials and post-graduate schools. A qualifications file is in course of preparation.

2.12 In Belgium, the Athenatel project is to present several different types of information about new technologies - glossary and bibliography, practical information (e.g. calendar), student dissertations and job information - through a single delivery medium: viewdata.

2.13 In the UK, the TAP (Training Access Points) initiative of the Manpower Services Commission is establishing its own local databases, but is also making major contributions of development funding to enable three of the main national databases (two of them funded by a different government department - the Department of Education and Science) to draw sufficiently close together to be presented jointly to clients at 'access points'. Between them, however, these databases do not cover the whole field; for example they do not include careers/occupational databases (of which there are several in the UK) nor the database on qualifications run by GES for the Further Education Unit.

2.14 In Ireland, three major training bodies are to be amalgamated in January 1988: AnCo (the Industrial Training Authority), the National Manpower Service and the Youth Training Agency. This amalgamation is likely to lead to a co-ordinated development strategy for training information; hitherto the three bodies have gone their own ways.

Sponsors and operators of databases

2.15 Almost all the databases surveyed were supported directly or indirectly by public funds. The way in which funds are provided reflects the divisions of responsibility within a particular country; the only trans-national pattern which has emerged from the study is that in several countries (Belgium, Germany, the Netherlands - and probably others) universities have sponsored databases.

2.16 Similarly, there is no European pattern of database operators. Some are government departments, some government agencies, some are institutions which are independent of government control but largely dependent on government funding. Surprisingly, in view of the origin of the funding, but perhaps not so surprising because of the need for technological know-how, a number in several countries are private organisations - some of them profit-distributing, others not.

2.17 The EEC Commission has promoted the Eurydice and CEDEFOP networks (which lie outside the scope of this project) and has provided funding for the database operated by the ICON Institut for the ASEAN countries. Another international organisation, the Madrid-based OEI (Organizacion de Estudos Ibero-Americanos) runs a database on university courses and grants for studying abroad in Spain, Portugal and Latin America.

Isolation

2.18 Within countries, databases were often isolated from each other, at least until initiatives to bring them together had been started. On a number of occasions the field workers found that they had discovered more about another database in the same country than the representative of the organisation whom they were interviewing.

2.19 Between countries, databases were even more isolated from each other. There are some exceptions to this generalisation:

* Centre Inffo of France is advising the Greek government on the creation of training databases

* Dioikema of Italy wrote to all EEC member states before proposing its database to the Italian government and took advice from Centre Inffo and from ECCTIS, MARIS-NET and PICKUP in the UK.

* The Dutch Centre for Curriculum Development at Enschede (SLO), which is the European agent for the Canadian CHOICES software, has been advising organisations in the Flemish-speaking community of Belgium (as well as, outside the scope of this project, providing consultancy on career databases in Sweden and Turkey).

2.20 Many database operators in different countries have had to face up to similar problems. In some cases they have adopted similar solutions, in some cases totally different ones. Because of the high cost of taking remedial action if an inappropriate solution is adopted, there should be some system whereby the database practitioners in different countries could be in touch with each other on points of technical detail. Indeed although policies are likely to be dictated by national priorities and by the availability of finance, there is also a case for policy-makers to be able to discuss more strategic issues about the provision of information. One of these issues, which affects all countries, is the question of the continuing financing of databases.

Financing of databases

2.21 All the databases studied required public funding to get started and almost all required some degree of public funding for their continued operation. However, this point conceals major issues of principle which are, to varying degrees, subject to debate in different countries.

2.22 The financial options are

a) information on vocational education and training should be totally free of charge

b) the main provision of information should be free but there should be a charge for publications and other ancillary services

c) information provision should bear a charge, but be subsidised

d) the full cost should be recovered.

2.23 In most countries there are those who think that information about education and training should be free of charge. The Service d'information sur les etudes et les professions (SIEP) in Brussels, for example, works on the principle that the advice it gives should be independent, individual, anonymous and free of charge.

2.24 Where the database or information service operator is part of the public service or is a university or other educational institution, the principle of free provision of information is usually adopted. The argument is that training information fulfils a public policy need. However, it is commonplace for databases to make a charge for printed publications, even though the operator may adhere to the principle that other training information is free. This is the case with Centre Inffo, SIEP, CENDIS, CID, BIBB, and the Berlin Weiterbildungsdatenbank. As will be seen in Chapter 5, purchase of publications is also acceptable to clients who otherwise might expect training information to be free of charge.

2.25 The principle of free information, however, does make databases vulnerable to changes in policy and priorities of funding bodies. This may be less of a threat where the operating body has been created by legislation (e.g. Centre Inffo); is derived from a service which will continue to be provided (e.g. University of Leiden or CID where, in both cases, public access has grown from internal advisory services to students at the host university); or is embedded in long-standing structure of training (e.g. BIBB Medienbank). One database operator of a free-of-charge service told the field workers that he feared the funding agency 'would have become bored with the database and want to try something new' when the current contract came to an end.

2.26 Not all databases adhere to the principle that information should be free. In the Netherlands, before the current moves to provide a co-ordinated system, initiatives were taken by Vondst BV to create, and by the Curriculum Development Institute to import, careers databases which were intended to become self-financing through sales to schools and other clients. Similarly, CEDEO (although receiving outside funding - since repaid - for the development stage) has become self-financing through sales of data and ancillary services. The government initiative referred to in paragraph 2.10 is likely to involve the provision of a service on subscription to secondary schools.

2.27 In the UK, probably more due to the traditions of public finance than current political philosophy, central government is reluctant to provide finance beyond a 'pump-priming' period. The present position is as follows:

* The aim of MARIS-NET and PICKUP is that they should become fully self-financing.

* Because its main market is in schools, which cannot afford to spend a lot of money on information, the ECCTIS database may not be able to be fully self-financing but is expected to become at least partly self-financing.

* The Further Education Curriculum Database on qualifications is being operated by GES on the principle that if it can become self-financing through sales of the data this will be an unplanned bonus. The public access element was not the main reason for the creation of this database, which was intended as an internal information system for the Further Education Unit.

* TAP local databases (whose main clients are individuals) do not charge for the provision of information, but this initiative is still in its pilot stage.

2.28 Where databases are intended to become self-financing, theoretically they have the options of charging information providers and/or users. Although a few databases studied had experimented with charging the information providers, [illegible] except one had abandoned this practice in favour of charging the user. [illegible] one exception is the PICKUP Training Directory in the UK, where a small [illegible]dling charge made to profit-making course providers only, on the [illegible]unds that they should not have their 'advertising' paid for by public funds.

2.29 Where the operator of the database is an organisation with no 'products' other than an information service (as MARIS-NET Ltd in the UK or CEDEO in the Netherlands), it must ensure that the database is eventually self-financing to survive without dependence on decisions of funding agencies over which it has no control. Such considerations are important to, but not quite so crucial for, organisations such as Data-Print GmbH or the ICON Institut in Germany and Guildford Educational Services in the UK, where the operation of databases is merely one of a range of commercial activities.

2.30 A major issue on the funding of some databases is the handling of variable costs. The major costs of a database can be treated as fixed: for example office overheads, core staffing, hardware and software depreciation, maintenance and insurance, allowance for marketing. However there can be considerable variations in

* the amount of data collected and processed; this affects all databases in the development stage, and even after the database is operational it affects those covering short courses, details of training institutions, and teaching and learning material

* the level of demand for data (whether expressed in enquiries handled or subscriptions or publications sold).

2.31 Public funding normally requires fixed annual budgets which make it difficult to handle large increases or fluctuations in these variables. Different approaches to this problem noted in the study included:

* the sale of publications (see paragraph 2.24 above)

* the purchase by public funds of a significant guaranteed quantity of data (ECCTIS, PICKUP and MARIS-NET in the UK - the first two also receiving grant funding), with the freedom to sell data to other clients

* in the case of the Berlin Weiterbildungsdatenbank, a contract by which the Berlin Senate pays Data-Print GmbH an agreed sum for an agreed amount of basic work, but with additional 'per item' sums for course details collected and enquiries handled above the basic level.

2.32 Another issue related to funding is the cost of providing face-to-face information. Where this has been done for a long time (as with SIEP) there seems to be an acceptance that it should continue. In the UK, however, training advice to individuals, which used to be available in Job Centres, was abandoned several years ago as an economy measure. Today there is interest in self-service information delivered through electronic media which, although it may require considerable development funding, in the long-term may prove to be very cost-effective. The MSC's TAP initiative, for example, is spending large sums on developing expert systems which would help the enquirer work out the questions he or she needed to ask of a self-service database. However, a large number of the database operators interviewed believed that, at least for individuals, who almost by definition are not likely to make frequent enquiries, there will never be any substitute for human contact, costly though that may be.

Chapter 3: Databases in context

Introduction

3.1 The project mainly concentrated on databases which are computerised and/or provide information to the public.

3.2 The study shows that there is no single 'best' way of designing and running a database. Database designers and operators have to work not only with the advantages and requirements of computer technology but within a framework of variables which tend to have an over-riding influence on how they set about their task. These variables include:

* background factors 'internal' to the database operators
* the content of the database
* the target clients.

This chapter addresses broad issues raised by computer technology and these variables, while Chapter 4 covers the features of database design and operation which cope with these factors.

Computerised databases

3.3 Modern computerised databases have significant advantages for their users:

* **Handling complexity:** computerised databases can search on several dimensions at once. Quite complex search criteria can thus be established, with the computer rather than the user doing the detailed work to produce the necessary results.
* **Speed:** increasingly, modern computerised systems enable such sophisticated searches of complex data to be undertaken almost instantaneously. This speed can benefit the user even at a distance. The Berlin Weiterbildungsdatenbank can provide a personalised letter with a detailed printout for each enquirer, often on the same day and always by the next day, handling quantities which could not otherwise be dealt with so quickly.

3.4 Where the user is also the database operator, there are other significant gains. Although paper and microfilm are still very effective for storing source documents, holding data on a computer has several advantages:

* If a database system is correctly designed, data need only be input once to produce a whole series of outputs - through different media, in different formats (in which, for example, only the relevant fields rather than the whole record need be output), or with different selections of content.
* Data from different sources can be blended, sometimes even with additions (such as a commentary) made part of the output. A database thus becomes a convenient and cost-effective way of storing and handling a great deal of complex data and providing bespoke information on demand.

* Computerised databases can hold **information in more 'dimensions'** than can normally be handled on paper. For example, to classify any one thing in several different ways a paper version would probably have to arrange the records according to one classification system, with complex indexing or cross-referencing to enable searching in accordance with another. A computerised database can contain any number of classification systems, employing any one at any time as the major search criterion as appropriate.

* Compared with a non-computerised system, or even with those computer systems which were available a few years ago, these advantages can lead to **potentially large savings in staff time** and improvements in productivity. Reducing the human factor in boring and repetitive work also improves the quality and reliability of information.

3.5 The great advantages of computerised databases have to be 'paid for' by new approaches to administrative procedures. For example:

* Data must be **maintained adequately** to ensure that it is comprehensive and up-to-date.

* Attention must be paid to **indexing.** Keyword indexing is particularly helpful to the user, but consistency in the use of keywords (and their relationships in thesauruses) puts considerable editorial demands on the staff responsible for creating and maintaining a database. Many databases offer free text searching, which can be a powerful facility for information retrieval but requires additional expertise in the user.

* The data is **vulnerable.** It can be changed so readily that it is necessary to have procedures to ensure that only authorised users can amend it. Computers can 'crash' or distort data in lesser ways, and it is therefore essential to have back-up copies of the data which is already held on the system.

* The data may refer to living individuals; thus there may also be legal requirements under national **data protection legislation.** For example, in the Berlin Weiterbildungsdatenbank, as soon as an enquiry has been answered the individual's name and address have to be deleted from the computer record (although other particulars are retained for analysis and monitoring).

Internal background factors

3.6 Many of the similarities and differences between databases can be explained by their history. They tend to reflect the time when they were brought into existence, including

* **the then level of development, availability and costs of computer hardware and software:** several large German databases which computerised existing printed material in the early 1980s use host mainframe computers with direct links to terminals in their own buildings. At that time, this was by far the most cost-effective approach. The PICKUP Training Directory uses a software/hardware combination which in 1984 gave the best compromise between cost and performance. If the same database were being started today, a much more powerful system would be available for the same cost.

* **the perceptions, priorities, funding available and even, occasionally, the enthusiasms of the funding agencies:** in the UK the DES-funded databases were encouraged to use Prestel, because at the time this was seen by the DES as being the most readily accessible medium for a computerised database. The PICKUP Training Directory, however, had to go onto Prestel via ECCTIS as a host because the cost of providing a sufficiently powerful computer for direct access would have been too large an element in the budget for the whole PICKUP initiative. Centre Inffo used Minitel as part of the French government policy of encouraging Minitel to become a well-used national system.

* **the emphasis, for constitutional or other reasons, on how far the database could be national, regional or local:** in France the Centre Inffo database started by being national, but in order to comply with the law on devolution to the regions, it is now undertaking pilot projects so that the data will be collected, held and accessed regionally; Centre Inffo will still hold data centrally for inter-regional access. In the Netherlands the aim is to create a national database, but there may well be regional sectic especially for course information relating to those employment level: ere there is little personal mobility. In Britain the ECCTIS, MARIS and KUP databases are all national, but MSC's TAP initiative, with its emphasis on local access, has found that it needs local databases to supplement the national arrangements; the relative weights to be given to national, regional and local collection and storage are a matter for debate. In Germany the Berlin Senate sponsored a regional database, and others are known to be in existence or planned in other Lander.

* **the initial, dominant tradition of the operating agency:** if the agency has a massive investment in documentation on paper, it will have a different approach to the creation of a database from an agency which is expert in the application of the content of a particular database, or from one whose main expertise is in information technology. The German DSE database is based on very thorough paper documentation which has been partly computerised. The computer is seen as a tool to aid documentation rather than as the central engine of the database. By contrast, MAR G-NET in Britain is computerised information system which hosts a nu er of different databases for on-line access. Again, in four countries small enterprises in the private sector (some profit-distributing, some not) have become involved in databases because of more general expertise in the content of data; these include Dioikema in Italy and GES in Britain, which are both concerned with many aspects of vocational education and training, CEDEO in the Netherlands which has expertise in the requirements of small businesses, and the ICON Institut in West Germany which provides third-world consultancy. Applications-orientated institutions also include FernUniversitat in West Germany, the University of Leiden in the Netherlands, SIEP and CID at the Catholic University of Louvain-la-Neuve, Belgium. Such organisations are often more concerned with the application of the information to those they perceive as their main clients than with the theory of database design and of indexing. In some of these cases their indexes are rudimentary and would not withstand scrutiny by information scientists.

* **cultural and political aspects:** these may determine the point of approach for major public sector initiatives. For example TAP in the UK and the Berlin Weiterbildungsdatenbank are largely aimed at adults, I-SEE in the Netherlands at secondary schools. These aspects may also vary within countries especially on such matters as whether a database should aim to be fully or partly self-financing (see Chapter 2).

Content of databases

3.7 Paragraphs 1.7, 1.8 and 1.9 list the content areas of the databases covered by the survey. Different types of content give different 'dimensions' to databases. These dimensions include:

* volatility: a database is volatile if there are frequent additions, modifications or deletions. Thus a database on short courses (PICKUP Training Directory, Berlin Weiterbildungsdatenbank, Centre Inffo, Dioikema) is likely to have a very large number of additions (as new courses are offered), modifications (particularly to start dates, price and contact names), and deletions (as the fixed dates for courses are passed - this can be handled in some computer systems by automatic deletion). By contrast, longer courses leading to qualifications, and particularly university courses, have few additions and deletions, and modifications may be handled adequately on a once-a-year basis. BIBB's Medienbank is not growing, only changing. Of the 6000 teaching aids, there are about 400 new ones each year, but there are many changes in price and content, and many deletions.

* urgency: although there may be infrequent changes in the provision of funding for training and legal aspects of vocational education and training, any changes are of immediate importance to the clients of a database.

* size of database: some databases can be described as 'location-free' (such as those covering training materials, funding for training, careers guidance, general details of qualifications, legislation), and these are not subject to the multiplier factor of locations which affect courses leading to qualifications, university courses and short courses. Bibliographic databases are cumulative and (unless labour-intensive action is taken to weed out dated items) open-ended in terms of database size. The effect of database size is considered further in Chapter 4.

* size of record and number of files: to a large extent the size of the record is a feature of database design (see Chapter 4). To some extent, however, the nature of the content determines the amount of information which is required. For example, records on short courses (PICKUP Training Directory, Berlin Weiterbildungsdatenbank) need to include a statement on the clients for whom the course is intended. However, for university course records such statements are redundant, although they may need to show the details of any entry qualifications required. Qualifications themselves may require large, or even multiple, records. Where a qualification is modularised (as is often the case in the UK) two files may be needed: one for the qualification itself and one for the modules which are part of it and which might also be part of other qualifications (as in the Further Education Curriculum database). Indeed, a third file for 'sub-modules' may also be appropriate, as the GES/ECCTIS report to the UK National Council for Vocational Qualifications (NCVQ) suggests.

* interactivity: some types of database content are more useful if there is a high degree of interactivity - going beyond the mere interrogation of the database. In particular, careers/occupational databases are no more useful than printed materials unless the enquirer can input personal details and search according to personal criteria. However, there is no consensus about what such criteria should be, with different criteria being used by CHOICES, VONDST and microDOORS. There is also

disagreement as to whether careers databases would be 'self-service' (as CHOICES or microDOORS can be) or only available to careers advisers (as VONDST). Another area of interactivity is where databases on courses allow for a statement of vacancies and potentially for the booking of places. (See Chapter 5 for some dramatic results caused by providing vacancy statements).

Target clients

3.8 Before Dioikema started its database activity it undertook a survey (see the case study on page 49) which identified potential users of different types of database. The results are shown in Table 1.

Table 1: Potential users of databases - the Dioikema classification

Category of users	Requests for information
1. Central administration	Description of qualifications; studies on the education and professional training market; foreign laws and regulations on the education and professional training.
2. Regional administration	Studies on the education and professional training market in Italy and in other countries; laws and regulations on education and professional training.
3. Guidance centres	Training courses; description of qualifications; training institutes working in specific subject.
4. Training institutions (private and public)	Studies on the professional training market in Italy and abroad; specialised institutions in specific areas; laws and regulations on the education and professional training; teaching materials; teaching staff.
5. Firms	Education and professional training courses; training institutions working in some areas; training modules; training materials; laws and regulations about public support for training.
6. Private users	Special courses; training institutes.

3.9 A shorter classification of potential users version produced by GES/ECCTIS for the UK National Council for Vocational Qualifications identified the target clients as

a) training professionals (training officers in larger enterprises, intermediaries, decision-makers in the training field)

b) people running small or medium-sized enterprises (SMEs), where training is a function of management rather than of professional trainers

c) individual members of the public.

3.10 There is a pattern about the way in which these various categories are likely to access data, and this pattern seems to be trans-national rather than country-specific:

* Training professionals are likely to be familiar with the training structure of their country and with the terminology used in databases for training; however, they are unlikely to want to leave their office to go to consult a database access point, whether in a public place (e.g. TAP in the UK) or in a dedicated centre (e.g. as at the University of Leiden). Therefore they need a desk-top system in which they can obtain information either by use of the telephone (or possibly by correspondence) or by an on-line or an off-line access system, to which they may subscribe.

* By contrast, individual members of the public are more likely to go to data access points to obtain their information. Although they may phone or write, because they are only casual users they are unlikely to take out a subscription. However their knowledge of the structure and terminology used for vocational education and training may be very patchy or non-existent.

* Managers of SMEs will have some of the characteristics of both the other groups. They will not wish to leave their offices to obtain the information (and as casual users are unlikely to want to subscribe), but they are also likely to be fairly ignorant of the structure and terminology of training.

3.11 Career databases are often explored by school pupils with a minimum of support for careers teachers or advisers. This has important implications for style of searching, the level of language and the presentation of the underlying concepts. The pilot I-SEE delivery system in the Netherlands obtains labour market information from the University of Maastricht and rewrites it in very simple terms for schools.

3.12 A further complication is the degree of confidence with which the target audience is likely to use computer keyboards or other input devices such as keypads or touch screens. In the prevailing state of general computer literacy it is more likely that training professionals (and indeed school pupils) will feel confident in accessing computer-held data than will managers of SMEs. The extent of computer usage for all categories is likely to vary from country to country.

3.13 It is a cliche that searching a database should be 'user-friendly', but what is friendly for one user may be hostile for another. It is difficult to arrange for the same data to be accessed readily by frequent professional users and inexperienced casual users, and by all who lie on the spectrum between. Frequent professional users will want to take short-cuts, and will accept the discipline of commands and codes to enable them to do so. These codings are likely to be incomprehensible to inexperienced users, who will often need a great deal of on-screen help to enable them to find what they are searching for. On the other hand, frequent users will find it unacceptably tedious to plod through a long series of menus designed to help the casual, inexperienced user. It is possible, but not easy, to design a single access system and indexing which readily provide for both extremes.

3.14 If a successful database has been developed for training professionals, policy-makers and funding agencies may assume that it could readily be used by small businesses and individual members of the public. This may not be true, as the transfer may require detailed re-design of access methods (e.g. moving from keywords to a menu-driven approach) and/or the elimination of codings as a means of searching; sometimes training jargon may need to be re-written in plain language. Some of the database operators visited during the project, particularly those using host mainframes, thought that the arrangements for searching and retrieval of data were too complex to be made available to users outside their organisation.

3.14 Similar problems can occur if a database designed for use by professionals to help naive users (especially in the careers field or on the availability of courses of higher education for school leavers) is so successful that the policy makers/funders think that it should be made available on a self-service basis. In the UK one approach to the problem of conversion of databases from reasonably expert users to naive users has been the commissioning by the MSC TAP initiative of expert systems to interrogate the users so that they can articulate their requirements to the database.

Chapter 4: Features of databases

Introduction: database design

4.1 The orthodox approach to the design of databases is to ask such questions as

* how many records will there be?
* how much information will each record contain?
* how frequently will the information change?
* how are the different types of information held by the database related to each other?
* how is it intended that records should be searched?
* how many, and how frequent, are the searches likely to be?

4.2 From the results of such questions, it should then be possible to provide a specification for the software; in turn the software should determine the hardware required.

4.3 In practice, however, many constraints obstruct such a logical approach. The funding available may preclude anything but a microcomputer solution. Uncertainty about the success of a project may oblige it to start as a microcomputer system; but, once the pilot stage has been completed it may expand to a mini-computer system (as with the Berlin Weiterbildungs-datenbank) or to a mainframe (as with the IBO/I-SEE links in the Netherlands) In other cases (especially in university-run databases) easy access to a powerful host with existing software may determine the choice of system (e.g. ECCTIS in the UK, and a number of German databases which use host computers). In some cases the over-riding need has been perceived as having an operating system in the language used by its clients (e.g. SIEP in francophone Belgium).

4.4 Nevertheless, the main features of database design remain

* size
* software and hardware
* data collection
* indexing
* means of access.

4.5 In addition, many databases offer ancillary services, some of these preceded the database, others were derived from it afterwards.

Database size

4.6 The size of a database depends on two factors

* the number of records
* the size of each record.

The sizes of databases surveyed varied from 60 records in Ireland's Council for Education Recruitment and Training for the Hotel and Catering Industry (CERT), 300 records in the GES Training Grants database, 600 records in the ICON Institut's Asean database, to over 40 000 (with planned growth to 65 000) in the case of the ECCTIS database on courses leading to qualifications. The bibliographic database on developing countries held by DSE (not strictly a database related to vocational education and training) has 40 000-50 000 references to books, monographs, and grey literature, with about 4000-5000 additions a year.

4.7 The Dioikema database has seven files of greatly different sizes:

	Records
postgraduate schools	128
description of university faculties	264
training institutions	715
training modules	1 003
teaching materials	2 970
non-university courses	6 107
university teachers	23 569

4.8 Database operators have different approaches to the size of record. One extreme is to confine the record to a single screen of 80 characters (e.g. the PICKUP Training Directory). However, when the PICKUP records are transferred to Prestel (with a 40 character screen) they need two or three screens. The next logical step upwards is to a record which takes one side of A4 (the same size as this page) on printout. The next step is two sides of A4 - the size of the database records on training opportunities in the EEC for Asean countries run by the ICON Institut. Dioikema uses very long records, partly as a means of tackling the problem of quality of courses; a lot of information helps clients to make better judgements on course suitability.

4.9 Other databases, especially those which provide free text searching, have not tried to compress the data in terms of screenfuls or pages of printout, but have tended to include whatever is thought necessary on the basis that users will scroll downward to read it all on screen. The advantage of this approach is that fields are not of fixed lengths, so that very long text statements or very large numbers of fields can be included where appropriate. There are, however, disadvantages if printout is required.

4.10 The size of the database is important for a number of reasons, including:

* the amount of internal memory (RAM) required
* when allied to the volatility of the data and its need for updating it may affect the resources needed for database maintenance
* it has considerable implications for the way in which on-line and off-line access media are used; for example a very large database can be handled in print only if it is divided into a number of separate volumes.

4.11 Above all, the size of the database determines its inertia, in the sense that it is more time-consuming and expensive to make changes to a very large database than to a small one. If changes are desirable but not essential (e.g. to enable communication between databases in different countries) ways of exchanging data are needed that avoid any individual database having to make major changes to its existing records. When new databases are being

planned, however, the designers should check what others are doing if there is ever likely to be an exchange of data. It is much easier to build in compatibility at the outset than to modify established databases.

4.12 Frequency of use is important both to the design of a database and to its continued survival. It also has a relationship with the size of a database. If the likelihood of any record being accessed within its shelf life (i.e. before it a becomes out of date) is very small, then there is no incentive for the training provider to give information. For example, if a database has 7000 records with an average shelf life of one year, and there are 500 enquiries a month but only one record is accessed per enquiry, then there will still be at least 1000 records which are never accessed during their shelf life.

Software and hardware

4.13 A wide range of mainframe and mini-computers are in use for vocational education and training databases across Europe. There is virtually no consistency in the use of software nor any pattern in choosing relational database software versus bibliographic retrieval software. In some cases databases in the French language are being run on software programs which have been designed to handle the requirements of French, including accentuation. In a number of cases hardware using French operating systems has been preferred to the dominant Anglo/American systems. In Germany Siemens systems are used to a considerable extent. This array of different hardware and software has implications for communication between databases, which are taken up in Chapter 6.

4.14 Where microcomputers are used, however, there is a noticeable adoption of IBM PCs or equipment compatible with them. Exceptions are Centre Inffo and Data-Print GmbH, but the latter has the necessary hardware and software to convert data from MS-DOS based IBM PCs to UNIX-based Siemens equipment, or vice versa. Microcomputer-based databases (e.g. ICON Institut, I-SEE, TAP local databases) often use dBase III or derivatives.

Data collection

4.15 In this context, data collection includes editing and other preparatory activities up to the point when the data has been input and proof-read for storage.

4.16 In the UK, the debate as to whether training databases should be national, regional or local is relevant to the issues of data collection and the avoidance of duplication. Two major principles are generally accepted in the UK and by database operators in other EEC countries with whom they were discussed:

* The system for collecting data should be appropriate to the provenance of the data, its nature and the intended layout of presentation and mode(s) of access.

* Original sources of data should not be required to supply data, nor to verify its accuracy, more than once.

4.17 There are a number of ways in which data can be collected:

* Data can be taken from brochures or other source material by the database operator. This approach is virtually the only one available for bibliographic databases, and is also suitable where the data is not volatile (e.g. university courses, other long courses, training institutions, details of qualifications, training grants); it is then possible to send a printout to

the original information provider for verification. This approach was adopted by ECCTIS in its original build-up of university and other long course data, by MARIS-NET for open learning, by the Further Education Curriculum database and, as noted, by all the bibliographic databases.

* With short courses, however, there is an open-ended amount of data to be collected from large numbers of establishments and organisations. In many cases there is a small 'window' of time in which the data needs to be available to the public. Data has to be edited and updated constantly, modified, or removed when course start dates are passed. As the small 'window' of time does not allow for verification of all the data, it is often preferable for the course providers to take responsibility for the accuracy by completing a form. This approach is adopted by the PICKUP Training Directory, the Weiterbildungsdatenbank and Dioikema, for example. One of its disadvantages is that the information provider has to fill in a form, which may be resented or postponed as an additional chore, making it much harder to make a database comprehensive.

  A number of databases spend a great deal of time in trying to obtain new data. At Dioikema, staff involved in collection try to discover new information sources and keep in contact with existing ones (universities, private institutions, public institutions). Contact is made by letter, telephone or face-to-face. At the moment, information sent by the different sources is transferred to the documentation department where it is checked and treated according to the 'classical' documentation method (description, abstract, indexing).

* The BIBB Medienbank in Berlin uses a hybrid system in which publishers of appropriate training materials are encouraged to complete part of a data collection form, and also to send an example of the training material so that more accurate completion, editing and indexing can be undertaken by the database staff.

* In the UK at least two cases were noted of 'remote' collection which it may be possible to develop into a model which would overcome the national/regional/local issues referred to in paragraph 4.16. ECCTIS has appointed regional agents who are responsible for obtaining, initial editing and inputting into microcomputers data concerning courses below university level. This data is then transferred on disc to ECCTIS for final editing and inputting to the mainframe. This system is now being piloted for the PICKUP Training Directory. Data collection for the Training Grants database is the responsibility of a sub-contractor, The Planning Exchange of Glasgow, which uses a consultant who is very familiar with the source documents and their interpretation. He summarises the information into the record format on a microcomputer and sends a disc to GES for editing, keywording and inputting.

* Two cases were found where statistical data was provided by government statistical services to another database for further analysis. One is a database on enrolments on all work-related non-advanced further education courses in a sample of Local Education Authorities in England and Wales. Statistical data is provided on disc to GES by the DES statistical branch and by the Welsh Office, allowing comparison of enrolments from year to year as a means of monitoring a particular government initiative. In Germany there is a similar transfer of statistical data by disc from the main manpower statistics held in Nuremberg to the Regional-datenbank Arbeitsmarkt at the Wissenschaftszentrum in Berlin (WZB). This data is then analysed for research purposes in a way which

. it is not currently possible for the collectors of the statistics to undertake. There are, however, considerable restrictions on the access which can be given to this data for fear that it might be used to identify individuals. The first case is an example of the use of database as a tool for a government analysis, the second of a use for research purposes.

Indexing

4.18 The primary aims of indexing are to:

i) ensure that no record is 'lost' in the sense that although it is on the database no-one can readily find it

ii) enable users of varying degrees of expertise to find what they want as quickly as possible.

Subsidiary aims include:

iii) ease of inputting (which affects both cost and accuracy of data)

iv) internal consistency (e.g. the same term must be used in the same way throughout, and variants of similar terms, (e.g. 'computers' and 'computing') should be minimised.

v) external consistency with other databases and other classification and indexing systems.

vi) ability for users to produce or use the classification system or keywords of a database to move rapidly from one record to another, with a result similar to normal browsing.

4.19 It is useful to distinguish between

* classification systems
* keyword or 'preferred term' indexing
* free text indexing
* use of a full thesaurus with entry terms, broader terms, narrower terms, related terms, 'use for' etc.

4.20 Many of the databases visited did not use a full thesaurus. Several different reasons were given for this. Some database operators have not found it necessary when their database is unlikely to be merged with others and is comparatively small (e.g. the ICON Institut's database). Others are not able to afford the time or resources to design a thesaurus, and in some cases an unacceptable time penalty would be incurred with inputting if particular software were to reject a record because indexed terms had not already been entered in the thesaurus.

4.21 Thesauruses are likely to be thought necessary where a number of different data collectors and editors are feeding the same central database. An example here is the CEDEFOP bibliography of training, where there are information providers from each of the member countries of the EEC. However, to maintain consistency there has to be a procedure for agreeing new terms to be entered into the thesaurus. This procedure can become a burden. For example, field workers were told that, at a recent meeting of the CEDEFOP Documentary Information Network, over 100 new terms had to be considered.

One German database uses an international thesaurus. This requires a bi-annual meeting of a German committee which approves new terms to be included, followed by a once-a-year meeting of an international committee.

4.22 Dioikema, whose database has diferent files on different subjects, is currently working out an appropriate index based on the UNESCO thesaurus. This is a particularly difficult problem as hierarchical relationship between terms is proving difficult to establish. AnCO has based its indexing on the ILO thesaurus.

4.23 There is an intellectual argument against using the classical type of thesaurus other than for bibliographic databases. A classical thesaurus involves the creation of a hierarchy of broader, narrower and related terms. The content of vocational education and training databases, other than bibliographic ones, may involve occupations, learning materials, qualifications, courses leading to qualifications, short retraining courses etc, each of which may have its own different hierarchies of what is broader and narrower. It is more important for clients to be able to understand the content in terms of its own hierarchy rather than in an artificial hierarchy based on words. An example of the way in which different occupations may have different views of a sensible hierarchy is provided by journalism. For most course providers 'journalism' would be a narrower term of 'writing'; for journalists 'writing' would only be one aspect of their work and would therefore be a narrower term of 'journalism'.

There could be an additional problem in describing the content of course modules of medium length (e.g. 40-100 hours assumed teaching time). Such course units may include several topics; for example courses in a wide range of engineering and construction subjects could include a short section on 'materials' or 'report writing'. Clearly, if these were used as keywords within a classical thesaurus they would belong logically under the broader headings of materials science (probably within general science) and language/ communication respectively. If, however, they are paired with more specific engineering or construction subject matter, then the classification of the course units should be within those specialist sections.

A further problem is that in most, if not all, European languages words may be used with different meanings according to their context. For example, in English 'bridge construction' could be a term within either civil engineering or dentistry. The term 'waves' could denote radio waves, light waves, ocean waves, psychological disturbances or hairdressing.

4.24 Quite independently, the ICON Institut and the PICKUP Training Directory have evolved systems which combine classification systems and lists of keywords. For each classification it is possible to produce on a computer a list of the keywords currently used within that classification. This simple idea has the potential for further development.

4.25 In the UK the MSC's TAP programme has commissioned from Logica Ltd a 'smart database searcher' to enable clients to search across the ECCTIS, MARIS-NET and PICKUP databases, or to move from one to the other without having to know that there are separate databases. One way of achieving this is to try to create a joint thesaurus which is of equal application to all three databases; there could thus be complications if two or three additional databases were added to the range across which users need to search. A first trial in the field of Hotel and Catering has been very successful and is to be extended to more complex subject areas.

A suggested alternative approach is based on the assumption that only a finite number of links are required between the different databases in vocational education and training, and that it would be possible to define these links and put 'hooks' for them in each of the separate databases. It would be easy for a client to move from a potential occupation to the employment prospects for that occupation, and if those proved attractive, to the qualification required for that occupation, then to the colleges at which courses leading to that qualification were being offered, or perhaps to self-study opportunites for such a qualification to the learning materials which might be needed. A similar approach has been tried by the pilot I-SEE database access system in the Netherlands, in which there can be movement between files on qualifications, on courses and on employment prospects. This type of approach may prove easier to achieve than complete integration of separate indexing arrangements into a common thesaurus. Nevertheless, in many cases the choices of keywords for indexing purposes can be somewhat arbitrary, and the effort of trying to harmonise keywords between databases is almost certainly worthwhile, even though complete commonality may never be achievable.

4.26 Classification systems are particularly important for ordering records in a medium which can be scanned visually. However, it is probably not worth trying to harmonise classification systems. A record which is stored on a computer can have multiple classification systems or indeed multiple classifications within a single system (e.g. 'computing for architects' can be classified under both 'computing' and 'architects'). Although common-sense suggests that there could be a sensible limit on the number of classification codes which are entered on a record, it would be possible, for example, to have a single European classification system which it would be possible for everyone to adopt in addition to those which they were using for internal purposes.

Access

4.27 Access arrangements can be classified as

* on-line
* off-line
* mediated
* hybrid.

4.28 On-line access involves the use of computer terminals to give direct access to the central database in order to retrieve data appropriate to a particular enquiry. Redundant data (in the sense that the particular user will never need to access it) is held by the database. Two aspects - the nature of enquirer and the nature of the enquiry - will have a bearing on the type of on-line access required, which might be as follows:

* Direct access to the database using the database's enquiry language provides the most powerful searching facilities, but the enquirer needs to be both knowledgeable about the data in the database and conversant with the enquiry language, which will often be expressed using Boolean logic. This is more suitable for database operators or regular users who can be given some training. On-line direct access to Dioikema's mainframe computer is available for a few trained clients (large enterprises, technological public institutions and research centres). The language BASIS is used to access all the data held in the Dioikema information system. In Spain, OEI's database BIDE provides on-line access through a host computer for institutional frequent users. In Ireland AnCO's databases are only available on-line to members of a closed user group.

* **Viewdata** is usually a menu-driven system, providing the easiest access for casual users, but is often time-consuming and limited in the extent to which it can provide useful information. Viewdata is used extensively by Centre Inffo (Minitel), ECCTIS, NERIS and the PICKUP Training Directory (Prestel), ResCue (TTNS) and MARIS-NET (Viewbase). In Germany database operators have so far considered the cost of viewdata hosts to be too high for current usage, but some experimental work is in hand to put FernUniversitat courses on the German BTX system. A similar view is held by database operators in the Netherlands, although an experiment with the French Minitel system is to take place in the south of the country. The Brussels-based Club Athena is employing a viewdata format for its ambitious Athenatel project to provide both database access to its members and an interactive communication medium between them. Its main menu is to offer five choices:

  1. glossary and bibliographic information
  2. practical information (press cuttings, addresses, calendar of courses and events, new products and techniques)
  3. shop-window of recently completed student dissertations
  4. information about jobs in new technologies
  5. electronic mailbox.

  In Flemish-speaking Belgium, the Centre for Andragogic Research is developing a databse on educational facilities for adults. The original plan was to hold data on a central computer and give access through viewdata. However, that has been postponed and meanwhile data is distributed on disc for IBM-compatible PCs.

* A **'user-friendly front-end'** anticipates frequent types of enquiry and provides a more easily understood way of expressing the search criteria, which are automatically translated into the database's enquiry language. In due course an expert system could be developed. This approach is being explored in the UK with development funds from MSC's TAP programme.

4.29 **Off-line or downloaded access** means that users must acquire redundant data, although in some circumstances they may be able to acquire relevant sections only of the database. Possible off-line media include:

* **Print**: this tends to be bulky and expensive to produce for large databases - one reason why the IBO database in the Netherlands is being computerised. In the long term, print may be a sensible option only for single line catalogues or indexes of data, or for sub-sets. At present, however, printed versions of databases have the advantage of being in a medium familiar to users. Print is the only medium for the CENDIS and BIBB Medienbank databases, and is extensively used by CEDEO, ICON Institut and Centre Inffo, and in a minor way by the Berlin Weiterbildungsdatenbank. Dioikema also distributes printed material such as bulletins and reports

* **Microcomputer discs:** it is possible to download parts of a database (which could be aggregated into the complete database) to microcomputer floppy disc. Adequate and cheap search software is commercially available, although in most cases it does not permit rapid cross-movement between one file and another. The problem arises with the limited amount of storage available on floppy disc. The cost to the user of electronic storage is often unacceptably high. It is thus likely that this medium of access will normally be used only for sections of a database. It is not usually practicable to supply source documents by microcomputer disc, but there will soon be a potential for doing this if WORM technology (see below) is widely adopted. Microcomputer disc is used as one of the main access media by the PICKUP Training Directory, the ICON Institut, the Training Grants database, the Centre for Andragogic Research, microDOORS, CHOICES and VONDST, and is also being tried experimentally by CEDEO and I-SEE.

* **WORM:** although not used in any of the databases seen in the survey, WORM (Write once read mostly) drives for 200 megabyte optical cartridges are now available for IBM microcomputers and were being considered by I-SEE and GES. An example outside the field of training was also noted: the Dutch Ministry of Welfare, Health and Culture is to use WORM discs as the basis for large public service databases. The plan is to put PCs with WORM drives in 1000 public and 6000 private libraries throughout the Netherlands. The PCs will access several large databases, of which one will be a directory of public services and another a bibliography. The databases will total about 1000 megabytes and will be updated four times a year.

* **Microfiche:** microfiche is exceptionally cheap. It is also possible to read computer output microfiche (with the equivalent of over 250 pages of A4) and source document microfiche (with the equivalent of 60-98 pages of A4) with the same 48 times lens, although it is preferable to use a dual lens reader. This means that the summaries from a computerised database and the original source documents from the originating bodies could be contained within the same medium at a low cost. Microfiche, however, is not very popular with users and is only used by the PICKUP Training Directory, the Further Education Curriculum database and, to a limited extent, by ECCTIS.

* **CD-ROM:** ECCTIS is using optical disc technology developed by the Open University Academic Computing Services. One CD-ROM disc can hold 600 megabytes of information (equivalent to 200 000 pages of A4). During the summer of 1987 a pilot CD-ROM containing the ECCTIS and PICKUP databases was pressed; users can search both databases without needing to know which they are interrogating. A further CD-ROM, scheduled for autumn 1987 also includes the MARIS-NET database. CD-ROMs require tight procedures and a carefully-planned chain of production and distribution operations. This means that the data may not be as up-to-date as if searched on-line, though there can be updating by floppy disc in between pressings of the CD-ROM itself, and the two sources can be merged by the microcomputer software. Other experiments in updating are described in paragraph 4.31. Dioikema intends to use CD-ROM for access by a large number of people, with user-friendly software. Only a sub-set of the overall data within the information system will be distributed by this means.

4.30 **Mediated access** means that the enquirer deals through a human contact at the main database centre or through someone who has access to the database on-line or downloaded. The redundant material is held by the database holder. Source documents can be made available to the enquirer. The service tends to be expensive to provide, which is why in the UK there is a great deal of interest in self-service information points. Mediated access is provided by Centre Inffo, DSE, the University of Leiden, SIEP, and CID at the Catholic University of Louvain-la-Neuve. In Spain, OEI's database BIDE provides mediated access for individual users.

An interesting example of mediated access with a great deal of computer support behind the scenes is the Berlin Weiterbildungsdatenbank. Printed leaflets are distributed in a large number of centres (and there are plans to deliver them to virtually all the homes in Berlin). These leaflets include a return postcard which can be sent to Data-Print GmbH. This postcard gives details of the user and his or her interests in taking a course. The information is then fed into a mini-computer which provides a printout of those courses which best match the user's requirements. The printout is sent to the enquirer under cover of a signed, personal letter. The enquirer thus has a feeling of personal attention through mediated access, even though almost all the work is done by computer. A similar approach has been used for several years by the BIBB Medienbank, but in that case there is more human intervention in the interpretation of the clients' needs.

In the experimental phase of the Dioikema information service (May to October 1987) clients had to contact the database staff and, assisted by them, to write down their requests for information and approve an estimate; subsequently they received an answer researched by the Dioikema documentation staff. The average response time was one week.

4.31 **Hybrid methods** of access are likely to be very efficient. In the UK, ECCTIS is experimenting with two of these to complement its CD-ROM, which (as noted above) has the disadvantage that the information may become out-of-date. This is particularly serious in August and September when ECCTIS provides a course vacancy service for those who want to enter universities or other forms of higher education. The vacancy position changes daily during this period. The experiments are as follows:

* **Softstrip:** this is a system which prints strips of data onto paper which are then read by a Softstrip reader directly into a computer. Each strip can hold up to 5.5 kilobytes. The strip image is far more robust than magnetic tape and can be read even if it has been crumpled or folded. It cannot, however, be transmitted by fax. ECCTIS has experimented with sending up-to-date data on courses with vacancies to a daily newspaper ('The Independent') which printed it on two occasions, as an experiment. It has been found that this data can be read by a Softstrip reader and fed into a computer which accesses the main database from a CD-ROM.

* **Datacast:** ECCTIS is also working with the BBC to broadcast data (BBC Datacast) in the unused lines of television broadcast. Attached to the microcomputer is a special decoder to receive the broadcast data and feed it into the microcomputer; the software apparently 'merges' it with the CD-ROM data, displaying the amended data instead of the original.

Self-service

4.32 As noted in Chapter 2, there is considerable interest in the UK in self-service systems. In most other countries public access to databases is expected to be mediated. However, viewdata and other on-line systems, subscriptions to microcomputer discs, WORMs and CD-ROMs inevitably encourage a type of self-service use. Special action is required when more than one database is to be accessed in this way.

4.33 Following trials with self-service screens, MSC's TAP initiative has identified the following design features as being important for any self-service display:

* menus and form-filling dialogues rather than free text entry;
* screen formats using appropriate business language and diagrammatic representations;
* a co-operative/counselling style of interface which helps the user to describe and solve the problem and gives advice in a way that allows the user to understand how the solution was reached;
* hard copy to take away;
* clear links to the human guidance service so that users can get further interpretation and help;
* the facility to get output from an interrupted session.

4.34 Early indications from research of some 670 users of the pilot TAP Points are that the general public may be more willing to make direct access by computer to obtain information from databases than had been anticipated.

There was also some evidence, which needs to be tested further, that the availability of such self-service-style facilities encourages those people who do not make use of other sources of information on vocational education and training opportunities. However, there is likely to be a range of circumstances in which some form of help, including mediation with the computer, may be preferred.

Additional services

4.35 In a number of cases public access databases are part of a comprehensive set of services being offered by the operators.

4.36 In other cases additional services may be a by-product of running a database or information system. For example

* CID at the Catholic University of Louvain-la-Neuve has joined forces with a Belgian publishing house to publish booklets on different career opportunities.
* Vondst BV in the Netherlands has started consultancy in the design of careers advice databases.

4.37 The additional services offered by Dioikema include a counselling service about

- the most appropriate training activities to follow
- observation and analysis of the training market
- mediation and distribution of information on foreign databases working in the same area.

4.38 One of the additional services for which there is a demand which it is difficult to meet is a statement on the quality of the course or learning materials. One difficulty is that quality (often defined as 'fitness for purpose') partly depends on the precise nature and needs of the client. For example a good course for one client may be useless for another. Different databases have adopted different approaches, for example:

- CEDEO only includes courses which have been vetted by a committee, and which provide a consultancy service.
- Dioikema (as already noted in paragraph 4.8) provides a great deal of information so the client has a better chance of judging quality.
- The Berlin Weiterbildungsdatenbank provides computer 'match-making' between client and course, although the quality of courses is not investigated.
- The PICKUP Training Directory is considering including a field in the course record to indicate whether a course provider is prepared to refer enquirers to recent clients for further information.

Chapter 5: The demand for information

Introduction

5.1 No study of the demand for training information can be complete because

- few market surveys have been carried out by database funders or operators
- where access is off-line by subscription the amount of use (take-up) cannot be monitored in the same way as it can when access is on-line or mediated.

5.2 Nevertheless there is a considerable amount of data which throws light on the demand for training information. Some of this has been incorporated in the text of this chapter, and a number of illustrative cases for which there is more information have been set out as five case studies in the Annexes to this chapter:

		Page
A	BIBB Medienbank: a training materials database	41
B	Centre Inffo: survey of the nature of the demand	44
C	Dioikema: research on potential users	49
D	ECCTIS: demand for on-line data	51
E	Weiterbildungsdatenbank: course information for adults.	53

Case studies B, C and D were contributed by Centre Inffo, Dioikema and ECCTIS respectively; A and E have been written up from information supplied to the field workers.

These case studies illuminate issues and provide some useful qualitative evidence. In the absence of comprehensive statistics on demand it would be premature to draw quantitative conclusions from them.

5.3 When considering the market for training information it is useful to distinguish between

- need (the providers' view of what the market ought to want)
- demand (the customers' view of what they do want)
- take-up (what the customers actually obtain).

5.4 Although there can be exponential growth if a service can meet an urgent demand which coincides with a need (see paragraph 5.24 and the ECCTIS case study in Annex D for a dramatic example), conversion of need into demand normally requires marketing, not just of the information but of the need for training itself. The conversion of demand into take-up not only requires marketing, but also attention to price. There is a general consensus among database operators, with some evidence behind it, that the demand for training information is price-sensitive.

5.5 There is clearly not a single market for information about education and training, but rather a series of market segments:

* decision-makers in government departments and agencies
* training professionals (including the training officers of larger enterprises)
* managers of SMEs
* teachers and careers guidance staff
* individuals (who may be school leavers, or their parents; young people seeking employment; unemployed adults, including women wishing to return to work after raising a family; employed adults).

It will be noted that these market segments nearly coincide with the different clients of databases, and the content in which they are interested, described in another context in Chapter 3; here, however, we are concerned with their demand for information.

Decision-makers

5.6 There is little evidence that decision-makers have so far regarded the systematic provision of training information as particularly useful in helping them arrive at their decisions. There are exceptions: GES, for example, has provided an annotated printout of the Further Education Curriculum database as an aid to MSC's Job Training Scheme. Decision-makers normally require quantitative information: the monitoring of work-related non-advanced further education in the UK was noted in paragraph 4.17. Information acquired in this way is often paid for on a consultancy basis, as is that supplied by the Wissenschaftszentrum in Berlin.

5.7 Decision-makers on training, both at national or regional level, could sensibly make more use of the mass of information latent in the databases which often they have funded. Even if the information is not in the exact form which they need, through the control of funds they could influence the data which was collected and stored. As has already been noted in Chapter 3, a computerised database can provide a range of outputs, and it would be easy to provide specialised ones for decision-makers. The wealth of information available is probably not appreciated.

5.8 This use of national databases as a tool could be spread trans-nationally for decision-makers in the EEC (see Chapter 7).

Training professionals

5.9 Training professionals are prepared to pay for information if they can get sufficient 'value-added' for their money. One market survey noted during this project was that undertaken by PA Management Consultants for the Scottish Development Agency on the possibility of the establishment of a comprehensive education and training database in Scotland (Scottish Data Services) - SDS. In this survey trainers were asked to express, in their own terms, the likely benefit of SDS compared with their existing methods of identifying training opportunities. Three major anticipated benefits emerged from a 'strikingly common pattern of answers':

* convenience: all the information in one place and everything presented in a consistent format.

- **speed:** searches would be quicker and information would be up-to-date.

- **enhanced choice:** because a database would normally have more information than internal research would provide.

5.10 It was also felt that there could be special value added

- by appraising the quality of courses (see paragraph 4.38)

- possibly by booking places on courses electronically.

5.11 The PA study also indicated that professional trainers in Scotland would be prepared to pay an annual fee of 140-210 ecus, but no more, for a subscription to an information service.

5.12 The PICKUP Training Directory, which is mainly aimed at training professionals and which has several different access media, is now running at about 2000 on-line enquiries a month in addition to the sale of subscriptions. If this is compared with the ECCTIS on-line figures in Table 5 on page 40, it will be seen that there is considerable potential for growth as a service becomes better known. However, up to now the service has been free (as has that of ECCTIS). From autumn 1987 modest page charges (0.07 ecus for a listing and 0.15 ecus for each record accessed) are being introduced for casual users, and from January 1988 subscription charges for heavy users. It will be interesting to monitor how these charges affect usage.

5.13 The PICKUP Training Directory is also available for subscription on microfiche and floppy disc. The whole directory costs about 245 ecus on microfiche and nearly 1000 ecus on floppy disc, but floppy disc modules of 250-1000 records (on either a subject or a regional division) are also available from about 140 ecus. Each subscription entitles the user to 4 re-issues of the whole directory in a year. Sales of microfiche subscriptions are expected to run between 60 and 100 per year. Sales of floppy discs are distorted by the fact that TAP access points and a number of Chambers of Commerce have had subscriptions bought for them by the MSC. Sales targets for other users to June 1988 are 1000 modules.

5.14 In the Netherlands CEDEO is willing to provide information on the availability of training courses with different prices for private individuals (11 ecus), companies up to 10 workers (22 ecus), companies above 10 workers (110 ecus) and training institutions (110 ecus). In each case the subscription is for a year and covers up to four hours of telephone enquiry. An in-house advisory service on which courses to choose costs a consultancy fee of 430 ecus per day. CEDEO also sells about 1500 copies of a printed listing of 4000 courses for under 130 ecus. CEDEO is experimenting with an on-line database with a limited number of users at a cost of 1300 ecus for the first year, and 650 ecus for the second year.

5.15 In its experimental phase, Dioikema is offering users the option of access across the counter through a window. In dealing with telephone, mail and direct requests, Dioikema will conduct searches for a fee whose size depends on the time necessary to locate and transmit the information. The estimate is given by telex or post to users, who send back written confirmation. The research itself is not conducted until the user's approval has been received.

5.16 Dioikema has undertaken two studies of potential users which are described in Annex C.

5.17 The BIBB Medienbank, a database of training materials for which the main market is training professionals, is described in Annex A.

Managers of SMEs

5.18 The problem with managers of SMEs is to get them to accept that they need to train at all, let alone that they need to obtain information about training opportunities. Mr H P Bruin, Managing Director of CEDEO, which has a special interest in training for SMEs, says he is spending much of his time 'preaching in the market place'. One rationale behind the funding of the Training Grants database by the MSC TAP programme was that it would also include financial grants available to business in addition to those for training. As SMEs and their advisors would be interested in the whole range of industrial grants it was felt that this would be a way of drawing attention to the availability of grants for training and hence the importance accorded by governments to training itself.

5.19 Experience in the Netherlands, in the UK and in other countries is showing that there must be a very large, positive and continuing marketing effort to ensure that SMEs are aware of the need to train, and that both they and the training professionals are aware that they can find information about training (at a price). The need for this marketing effort, and its cost, may well be under-estimated by funding agencies, who may also expect that there will be an immediate response to the availability of a public access database in the training field. The pattern shown by the SIEP figures in Table 2 on page 37 can be replicated in database after database. Those embarking on the creation of databases need to be aware that it will almost always take several years to achieve a reasonable frequency of use.

Teachers and careers advisers

5.20 The I-SEE information system is aimed at careers guidance in schools. A market survey of a sample of about 300 secondary schools (out of a total of about 1400) indicated that about 80% would be prepared to buy the I-SEE system for between 430 and 860 ecus for two issues a year. However, actual sales of the VONDST and CHOICES systems have not reached that level.

5.21 The ResCue on-line information service is aimed at teachers involved in vocational preparation in the UK. Most of these will be in the post-school sector. This is now averaging about 560 enquiries per month on-line for the full range of its information services, which include teaching materials and information about developments.

Individuals

5.22 In general, individuals do not expect to pay for information about education and training unless they purchase something tangible, such as a book. However, the demand from individuals can be large and their need for a centralised information source is considerable because few have the time or ability to conduct their own research. Their use of a particular information service, however, may take some time to build up. Figures given in a survey by SIEP

for the years 1973 - 1984 show how there was a slow build-up in the early years with a plateau reached in about the seventh year of existence (see Table 2). Although exact figures were not available, there has been a great increase in 1985 and 1986, and the Director of SIEP is certain that this is due to two factors: unemployment created a greater need for this information, and meanwhile SIEP has become better known as an information source.

Table 2: Number of enquiries handled by SIEP, Belgium

1973-1984

1973	272
1974	1 681
1975	2 495
1976	3 627
1977	5 182
1978	5 521
1979	7 332
1980	6 775
1981	7 285
1982	7 320
1983	7 709
1984	6 812

5.23 The Centre d'information et de documentation sur les etudes et les professions (CID) at the Catholic University at Louvain-la-Neuve has kept statistics of the growth of enquiries from 1981-1985, both by the type of person enquiring (Table 3 on page 38) and the nature of the enquiry (Table 4 on page 39).

5.24 In some countries there is a very high demand from individuals for information about educational opportunities, especially at universities and other institutions of higher education, when school leaving or other entry examination results are known. SIEP, for example, has a very high peak in August. ECCTIS provides an on-line service which gives information in August and September about the vacancies available in degree courses at various institutions. In 1986 this service was first offered, but only for courses at polytechnics and colleges. Table 5 on page 40 shows the effect of this service on the general pattern of demand for ECCTIS information by comparing 1985 and 1986. In 1987 the service was extended to cover university courses; in the first five days of August over 25 000 enquiries were handled on-line. A longer account of the demand for ECCTIS information is given in Annex D.

5.25 The Berlin Weiterbildungsdatenbank is handling about 100 enquiries per day from individuals. The build-up to this figure has been much quicker than in other cases, largely because of the high profile adopted by the Berlin Senate for this database and the very large sums spent on marketing. A case study describing this database is given in Annex E.

*Table 3: Growth of enquiries to CID * Information Service by type of enquirer*

		1981	1982	1983	1984	1985
Etudiants en cours d'etudes universitaires	University students	588	727	880	1109	1353
Finalistes de l'enseignement secondaire	School leavers	1034	837	935	1186	1372
Diplomes universitaires ou de l'enseignement superieur	Graduates	263	329	393	574	691
Etudiants de l'enseignement superieur	Senior pupils	97	202	276	295	196
Parents ou tiers	Parents or relevant adults	506	697	754	842	866
Institutions - Services (UCL - PMS - Ministeres autres universites - journalistes)	Institutions and agencies	210	211	275	238	297
Directions d'ecoles - professeurs	School principals and teachers	38	44	76	42	57
Personnes au travail recyclage - education permanente	Updating/continuing education students	92	160	186	241	271
Chomeurs - pas de diplomes secondaire - pas d'equivalence	Unemployed without qualifications	165	89	67	153	140
Situation non precisee	Others	55	77	33	133	223

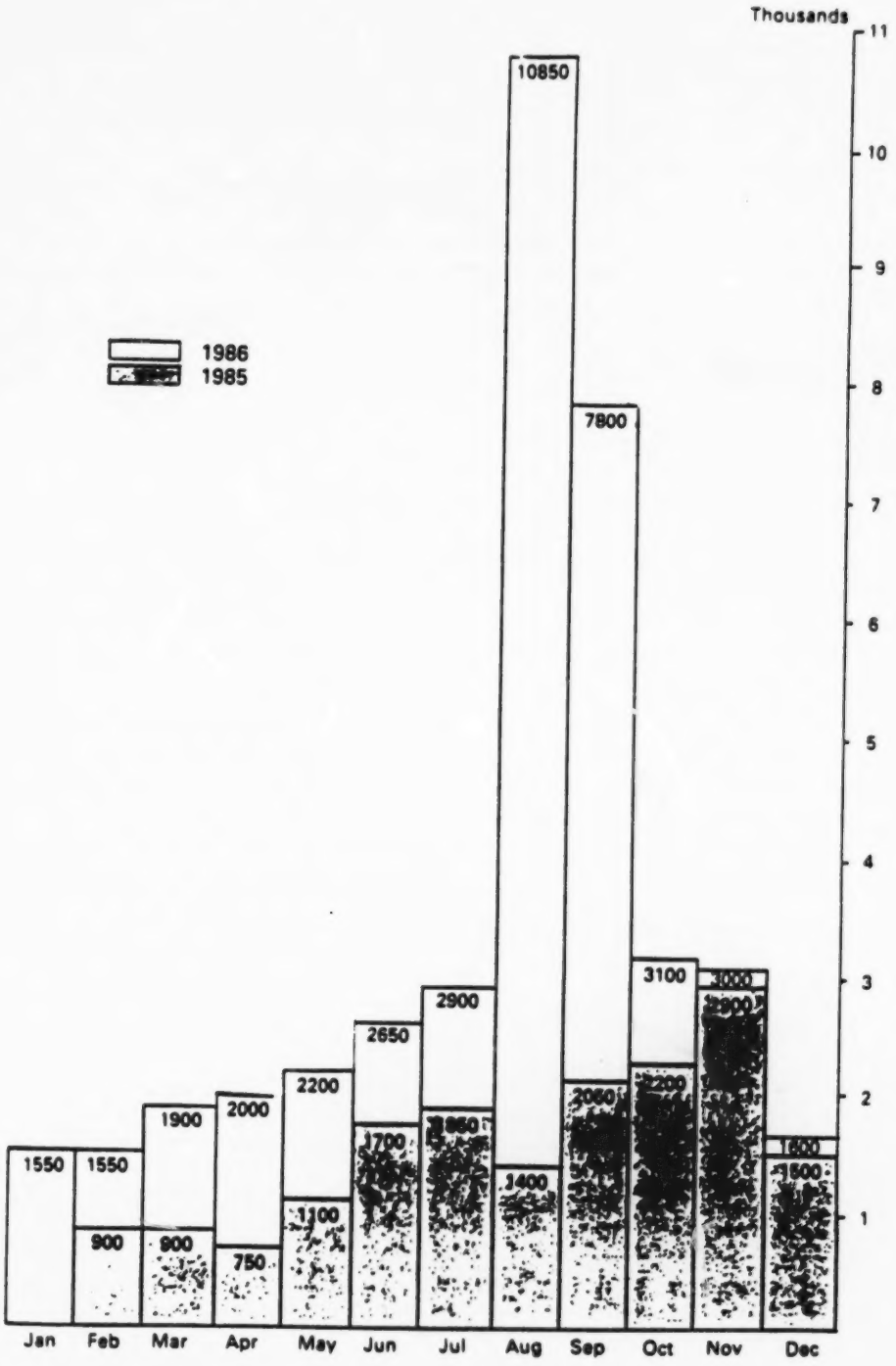
* *Centre d'Information et de Documentation sur les Etudes et les Professions de l'Universite Catholique de Louvain*

Table 4: Growth of enquiries to CID Information Service by type of enquiry*

ENQUIRIES		1981	1982	1983	1984	1985
Univ. (debouches-choix Specialites de licence	) University	921	952	1 314	1 453	1 603
Etudes univ. complem	) courses	218	742	603	693	729
Super. non univ.	Advanced non-university	772	771	885	1 043	1 100
Etudes second. + Instituts preparat.	Secondary school + preparatory intakes	124	157	110	170	162
Jurys Etat ou examens entree univ.	State qualifications or University entrance exams	156	152	167	207	191
Formations a l'etranger	Training abroad	105	148	245	269	266
Travail a l'etranger	Work abroad	29	40	62	63	49
Travail-Recherche emploi	Research work experience	119	152	191	181	192
Cours de langues	Language courses	87	152	264	283	251
Cours promotion sociale (Soir-Week-end)	Evening/weekend classes	177	215	286	414	362
Recyclages Educ. permanente	Updating/continuing education	134	172	278	294	291
Info sur Services UCL Social - Admin. - Facultes	What about educational, social & internal services	198	377	440	878	1 112
Info sur Services Exterieurs a l'UCL	Information about external services	71	143	130	497	209
Info sur CID (Public - Activites...)	Information on CID	94	157	210	216	228
Reorientation - Echecs	Career change, failures	420	323	335	407	590
Divers	Miscellaneous	85	30	87	81	193
Total	Total	3 710	4 683	5 607	7 149	7 528

* *Centre d'Information et de Documentation sur les Etudes et les Professions de l'Universite Catholique de Louvain*

*Table 5: Growth of on-line enquiries to ECCTIS **



* Educational Counselling and Credit Transfer Information Service

Annex A - BIBB Medienbank: a training materials database

A1. The Bundesinstitut fur Berufsbildung (BIBB) is a federal government agency, located in Berlin, working in the field of vocational education and training outside schools, thus mainly in-company training. Its brief includes media research and publications related to programmes of vocational training. Some 10 years ago BIBB established the Medienbank, a database on training materials which was originally held on paper but more recently has been computerised.

A2. The Medienbank contains some 8000 records of training materials, classified in a number of ways, including medium and sector of industry. It handles some 2000 requests for information a year, some being multiple enquiries; almost all are written, normally on a card supplied by the Medienbank which also gives guidance on the preferred search terms. A search is then made on the computer and a print-out posted within a few days of receipt. There is no charge for answering an enquiry.

A3. The Medienbank has kept cumulative records of the enquiries it has received. By mid September 1987 these had reached a total of 37 723. Some of the results are shown in the tables below:

Table A1: Enquiries by industrial sector

Classification under more than one category is possible

	No	%
Economics and administration	5 426	14.42
Metallurgy	19 382	51.52
Electrotechnical	14 683	39.03
Building trade	3 280	8.72
Timber industry	3 933	10.45
Textile industry	1 779	4.73
Chemistry/physics/biology	2 461	6.54
Printing	683	1.82
Colours/paints/interior decoration	1 537	4.09
Health	828	2.20
Personal hygiene	848	2.25
Food and housekeeping	1 784	4.74
Agriculture	660	1.75
New technologies	1 005	2.67
All professional areas	5 624	14.95
No specific professional area	2 738	7.28
Not covered by professional or trade association		
(i) computer processing	303	0.81
(ii) other	1 781	4.73

Table A2: Enquiries from enterprises

Classification under more than one category is possible

	Number	%
Industry	9 220	61.63
Trade	391	2.61
Craft	414	2.77
Services	1 134	7.58
Book trade	2 706	18.09
Media production	609	4.07
Magazines	671	4.49

Table A3: Enquiries by individuals

Classification under more than one category is possible

	Number	%
Tutors	3 029	16.76
Instructors (managers)	1 001	5.54
Masters	706	3.91
Teachers	4 601	25.46
Teachers (directors)	173	0.96
Vocational advisers	31	0.17
Educational advisers	398	2.20
Subject executives	136	0.75
Managers	159	0.88
Project leaders	243	1.34
Journalists	191	1.06
Others	7 810	43.22

Table A4: Analysis of institutions interested in Medienbank

Classification under more than one category is possible. This table includes all those institutions which constitute the Medienbank's market and not only those which have requested information.

	Number
Schools for general education	297
Professional and trade schools	2 282
Meisterschule (schools leading to final qualification in a trade)	316
High schools	889
Further education establishments	1 147
Official education establishments	357
Private education establishments	1 336
Confessional/religious education establishments	260
Vocational education establishments	111
Adult education	501
Educational film hire services	495
Armed forces	151
National railways	167
National post office	134
Employment offices	315
Libraries	421
Scientific institutions	740
Scientific institutions (GF)	27
Education seminaries	80
Education colleges	179
Associations/clubs	875
Department of trade and industry	362
Trade corporations	324
Factory inspectorate/professional trade associations	48
District trade associations	151
Guilds	248
Trade unions	936
Chambers of agriculture	23
Other chambers and associations	118
Parties	98
Ministries (federal)	72
Ministries (state)	175
Education authorities	211
Education public service	96
Local town administration	273
District authority/administration	118
Federal authority/adminisration	90
Legal authority/administration	72

Annex B - Centre Inffo: survey of the nature of the demand

In 1986 the Centre Inffo carried out an investigation among information providers, with the following results.

The categories and their limitations

The public can be classified according to

(a) their employment position (seeking employment, in employment),

(b) their possibilities for further training (employers, employee representatives, training agencies)

(c) their age (especially the young), their sex (especially women) or their socio-cultural

The limitations of such a classification must be admitted; the real position is much more complicated. A specific concern such as the problem of youth does not take account of an individual's circumstances or the social differences found among the young. A young person may be in work, looking for work or seeking training (more and more commonly because no work is available) or may be a student at school or at university. What do these young people have in common apart from their age?

The problems caused by the lack of suitable work or training tends to prolong the period of adolescence for many young people. Increasingly they live in the family home much longer than in the past - often until they are 25 - and in some cases even longer. In addition some of those who have taken the step of leaving home subsequently have to go back to live with their parents. The socio-economic dependence of the young increases their difficulty in achieving social and emotional autonomy.

It is essential that when advice or guidance is being given, the adviser should take into account not only the explicitly stated request but also those other factors - individual, economic, family, social, school record - which give a complete picture of the true need of the individual. Their level of knowledge, ability to express their needs, capacity to ask and write down the right questions - these are often more important differences than the criteria of age, sex or employment status.

The great variety of those who ask for advice from official bodies partly explains the complexity of the task facing information providers. It points to the limits of the recorded results where those applying may be young people, women or migrant workers and at the same time classified as seeking training, unemployed or in work.

Trends in the nature of those seeking official information

For the great majority of those ing guidance and of the various bodies engaged in this work, it is very clearly the ung who make up an increasingly important proportion of those seeking help (44%).

The responses from the relevant bodies confirms this finding:

ANPE	Young	- 41%
PAIO	Young	- 76%
CIO	Young	- 53%
FAF-FONGECIF	In work	- 57%
CCI	Unemployed	- 78%

While for FAF and FONGECIF their most important category - those in work - is increasing, for CCI, the proportion (78%) of inquiries coming from the unemployed is highly significant.

These findings indicate a trend towards diversification of enquiries which makes the original purposes for which the institutions were set up increasingly irrelevant. More and more young people who are ostensibly asking about training are actually looking for jobs.

A large majority (71%) of counsellors, whether dealing with the general public or specialised groups wish to work in a situation where all members of the public can come for advice. Most counsellors believe that the information agency should be able to offer both general information and specific information. Only the CCI's counsellors are divided between this arrangement (40%) and those who wish to limit their field of operation (legal advice, detailed knowledge of particular occupations, availability of training, availability of work in their preferred field). On trend, then, 'specialised' counsellors are becoming more and more generalised while 'generalists' are increasingly asked for specialised advice.

Many organisations find that they are dealing with people holding even higher qualifications, of levels II and III, such as those seeking employment who hold a BTS in information sciences while at the same time many of those seeking advice have very low qualifications (V two and VI).

The absence of answers to the problems of training and unemployment not only causes confusion among counsellors and clients, it also alters the nature of the advice and the conditions in which advice is given. Faced with the very great variations in the demands made, and asked to give advice in areas outside their original field of knowledge, counsellors are resorting to increasingly standardised answers.

Nature of the requests for information on training

The commonest requests for information on training essentially relate to four areas:

1. Regulations; legislation; rights and rules of behaviour; financial implications.

2. Attainments; changes in trades and professions, qualifications.

3. Availability of training; identification of the course of training required, training agencies, curricular and teaching methods, methods of validating attainments etc.

4. The employment market; appreciation of the socio-economic context of the training.

The explicit demand for information (made by any individual or by groups of people) in any of the above categories must be understood in the context of the background - both personal and social - of those making the demand. It is important to notice all the non-verbal behaviour shown by an individual seeking advice. The client's general manner, body language, appearance, ability to listen, even silence - all can provide valuable clues to the interpretation of a request that is often made in confused, stereotyped and fragmentary terms. All too often, the counsellor plunges into giving a

reply to a specific request (influenced by the urgency with which the request is made) instead of taking the time to establish rapport and understand the background to the question.

What is the commonest difficulty reported by counsellors giving advice on further professional training? Often the client lacks the qualifications required for admission to training. Table B1 on page 47 summarises other difficulties identified by counsellors in the field of further training.

What are the pros and cons about whether agencies should provide advice to specific groups (the young, women, migrant workers) or to the public as a whole? A 'single office' can advise people on all of the problems they encounter - training, employment, housing, leisure activities etc. This allows for the concentration in one centre of all those authorities dealing with a particular group and also allows for coherent developments.

According to the survey, a large majority of counsellors - both 'specialists' and 'generalists' - believe that any information agency should be open to all those seeking advice and should be able to give both general information and information of a more specific nature. Not enough agencies at present are designed to give information to all who need it. The growth in agencies designed to deal with specific groups seeking advice, has, in many instances, given rise to agencies which are better co-ordinated and more effective. However the great diversity of advisory agencies seems to prevent different groups from understanding the functions of each of the agencies.

Table B2 on page 48 emphasises the need for coherence among counsellors in putting together and co-ordinating the many skills which they use in their work.

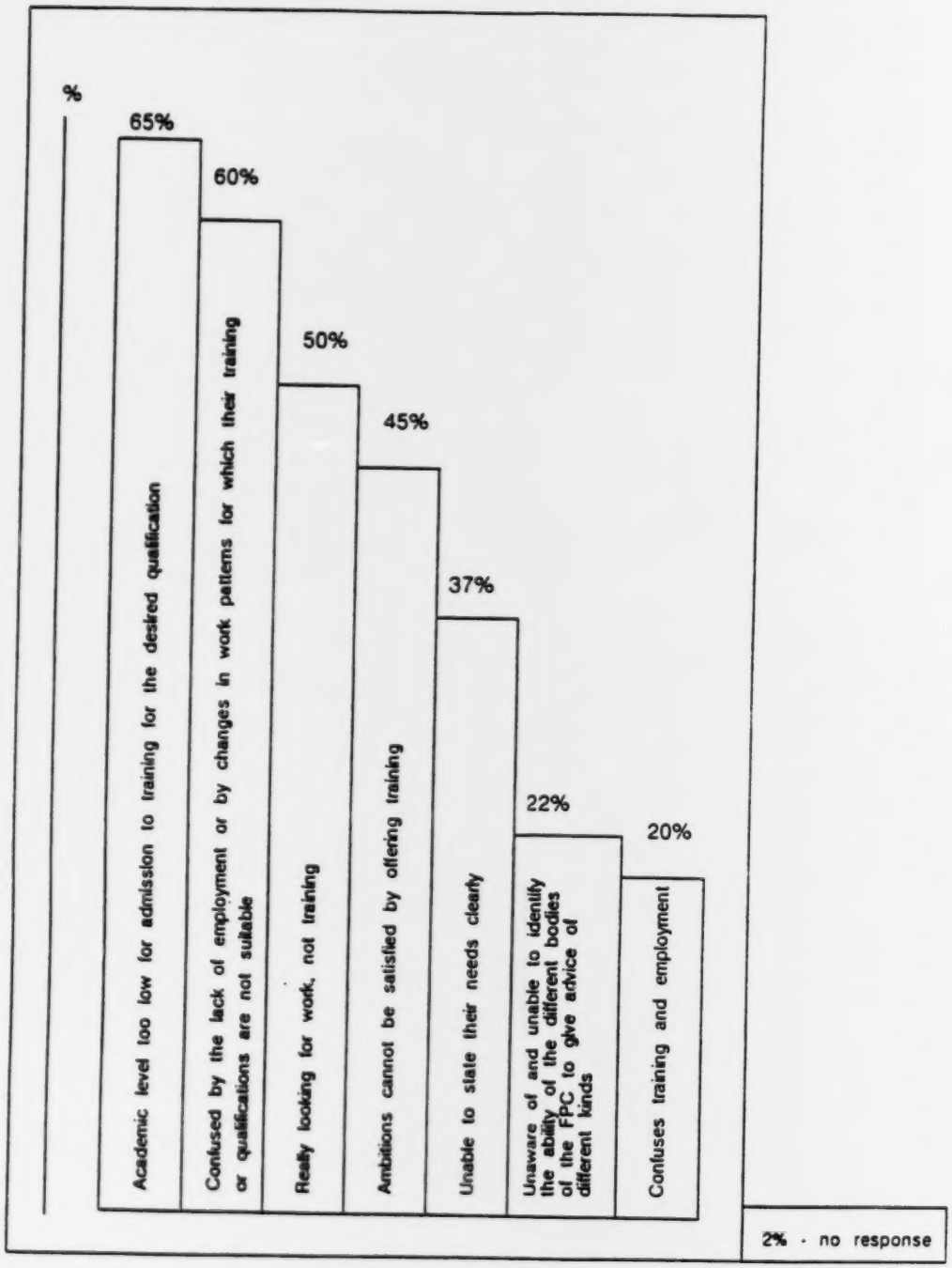
Table B1: 'Specialised' or 'generalist' counsellors - How do the counsellors view their roles?

In total *		By organisation (in %)				
		ANPE %	PAIO %	CIO %	FAF %	CCI %
71%	An information agency should be open to all kinds of people and should offer both general information and specialised information, appropriate to the circumstances	97	72	80	60	40
25%	A specialised agency is inevitably required for certain groups - young people women, migrant workers - and requires specialised ability	10	45	44	27	8
12%	The people who must above all be well informed are those who take decisions in the socio-economic field and educators concerned with public affairs	2	13	20	33	23
12%	More useful to offer advice in a limited field (e.g legal advice, detailed advice on particular occupations, availability of training, the work market) - available to all those seeking advice		4	10	20	40

* Statistics obtained from a multiple response questionnaire

Table B2: Commonest problems reported by counsellors in the field of further education

Findings obtained from 290 respondents


%
65%
Academic level too low for admission to training for the desired qualification
60%
Confused by the lack of employment or by changes in work patterns for which their training or qualifications are not suitable
50%
Really looking for work, not training
45%
Ambitions cannot be satisfied by offering training
37%
Unable to state their needs clearly
22%
Unaware of and unable to identify the ability of the different bodies of the FPC to give advice of different kinds
20%
Confuses training and employment
2% - no response

Annex C - Dioikema: research on the potential users

Dioikema has carried out two studies to identify its users and their information. The first study was carried out on a sample of 150 potential users in the following categories: national and international corporations, local authorities, training centres, trade associations, enterprises. Potential clients for its services, in order of priority, were

1. enterprises
2. government agencies
3. training institutes.

Around 20% of users had some experience in interrogating databases. The data requested most often was about qualifications, courses, teaching materials and training institutions.

The users' preferences for access systems were written materials (21%) and on-line distribution (20%). Only 0.5% of the users were interested in distribution on floppy disc.

All exc[illegible]ndividual users accepted that the service was obliged to charge for informatic.

The study also enabled there to be an analysis of the interrelation between users and their information requirements, shown in Table 1 on page 18.

The second study was carried out by handing out a questionnaire during the presentation (on 4 May 1987) of Dioikema Information Systems to those in the training business. The questionnaire was designed to identify three kinds of information:

a) the corporation represented by the potential user and/or his qualification;

b) the general approach to databases and the interest in specific files, subject areas, and interrogation;

c) the interest in different ways of accessing the information system and the possible requirements concerning deadlines.

The questionnaire allowed space for the users' notes or suggestions.

59% of the 102 questionnaires handed out to those attending the seminar were answered in full.

37.3% of those attending the seminar represented service corporations and, specifically, public and private training institutes (22%). They were interested in a database on training because it would enable them to observe strategically and economically the trends in this area. Public and private institutes require information about:

* training activities already carried out by Italian institutes
* training activities already carried out or planned by foreign institutes
* names of institutes dealing with specific subject areas
* training legislation.

Local authorities (32.2%) which plan employment and training policies were also much interested. Regional districts require information that enable them:

* to set the objectives of their planning

* to identify the means to reach them.

Table C1: Distribution of those attending the seminar according to the organisation they represented

	Percentage
Central government units	6.8%
Local authorities	32.2%
Manufacturing industries	5.0%
Service companies	37.3%
Others	12.0%

77% of the sample had already consulted a database both directly (53.3%) and indirectly (47.7%): such users are familiar with the 'philosophy' of databases. As to the individual files of Dioikema, the one concerning 'courses' (either existing or planned) was of the greatest interest to the users (22%); next came the files 'training institutes' (17%) and 'qualifications' (18%). Answers revealed a strong interest in all levels of information offered by this service. All subject areas were of interest to the sample, with a preference towards management (28.5%) and technological innovations (27%):

Table C2: Distribution of the preferences towards the subject areas offered by the Dioikema Information Service

	Percentage
Management	28.5%
Technological innovation	27.0%
Environment and territory	22.0%
Energy	13.5%
Others	9.0%

The main preference of the respondents was for traditional methods of access:

* printed materials (bulletins, reports) 30.2%

* mediation across a counter inside Dioikema 22.0%

As to innovative ways of access to information, the sample chose on-line distribution (29%) through a host. Distribution through Videotel (9.4%), Televideo (4.2%) and optical discs (5.2%) seemed less attractive to the sample.

Since the sample interviewed was made up of those in the training business it was important to understand the influence of planning training activities on the deadlines and procedures of the service: 46% of the users approached the service when close to specific deadlines; 37.5% of them when planning their courses.

Annex D - ECCTIS: demand for on-line data

The Educational Counselling and Credit Transfer Information Service (ECCTIS) is a mainframe database of information about all award-bearing courses in further and higher education, from non-advanced to postgraduate level, throughout the United Kingdom. It provides answers to questions about what subjects or skills can be studied where, in what named institutions, in what way (e.g. full- or part-time), with what entry requirements, and so on.

By September 1987, the database contained over 40 000 course records; on final completion in 1988 the total is likely to be nearer 60 000 records. This data is stored on the Open University's Unisys 1100/82 mainframe at Milton Keynes. This has been accessible on-line through a Prestel gateway since the service began early in 1985, and has also been searchable through The Times Network Systems (TTNS) since mid-1987.

The demand for ECCTIS data on-line has more than doubled each year. The following table, notes and observations illustrate the continuing steep rise in demand since the service began.

Table D1: On-line use - actual and forecast

Year	Total number of enquiries (a)	Approx. total number of questions asked (a)	Type of enquiries (b)	
			courses	vacancies
1985 (c)	18 000	27 000	18 000	-
1986	42 000	63 000	27 000	15 000
1987 (d)	100 000	150 000	55 000	45 000
1988 (e)	200 000	300 000	110 000	90 000

Notes

(a) The number of enquirers logging on through the gateway is automatically monitored. However many enquirers ask several different questions once they are on-line. Detailed daily monitoring indicates that the total number of questions asked is about 50 per cent above the number of enquirers.

(b) The ECCTIS year-round service offers information about courses. For six weeks in August and September that service is enhanced to give daily up-dated information about which degree-level courses still have student vacancies for the about-to-start academic year. Enquirers, having logged through the Gateway, have the choice of selecting information only about vacancies.

(c) 1985 figures represent 11 months' demand because the ECCTIS on-line service began at the end of January 1985.

(d) 1987 figures include demand from Prestel and TTNS subscribers, although the TTNS link was only introduced in mid-year. The annual figures are extrapolated from the figures recorded at the end of August.

(e) 1988 figures are forecast on a simple doubling of demand over 1987. That may prove to be a conservative estimate since previous years have shown more than a doubling and 1988 will also be the first full year of the TTNS link.

Observations

(1) From general observations and particular enquiries to ECCTIS users, the growth of demand shown in the table appears to reflect an emerging awareness of the ECCTIS service and its relevance and value to them. It equally reflects their gradual acquisition of the necessary equipment, which was much less widely available in 1985 than it is now.

(2) The rapid growth has also been stimulated by the urgent 'need to know' about course vacancies in August and September, when daily up-dated information saves staff time and costs in otherwise lengthy sessions of individual telephone calls to each providing institution. Users have been introduced to ECCTIS through the vacancy service and have continued to use it thereafter for the general courses information.

(3) In a publicly accessible on-line database, it is difficult to identify user categories wtih any precision. However, evidence of logging-in time and duration of enquiry suggests that up to 90% of ECCTIS enquirers are professional staff in the education and training sector; the remainder appear to be members of the general public.

Annex E - Weiterbildungsdatenbank: course information for adults

1. The Berlin Databank (Die Berliner-Weiterbildungsdatenbank) is run for the Berlin Senate by Data-Print GmbH, a software and data processing company. The background is that for many years after the war Berlin concentrated on the type of industry which did not need highly skilled workers. The result was that skilled workers tended to migrate from Berlin and the labour force in the City was not prepared for the switch a few years ago to the need of high-tech industry (electronics, telecommunications, pharmacy), nor for the growing number of office and tourism jobs. A few years ago 25% of all companies in Berlin were reporting a lack of skilled workers. Some were able to import workers from elsewhere in West Germany. The Berlin Senate therefore believed that by encouraging existing residents in Berlin to become better qualified they would reduce local unemployment and make it unnecessary for workers to come from outside. The Senate therefore initiated a 'qualification offensive'. Part of this qualification offensive involved the creation of a database and information service on training opportunities.

2. The database is structured around

   * the course providers

   * the German official lists of 1230 'professions', sub-divided into 80 professional groups

   * the details of the courses.

3. The database contains information on some 7000 courses being held on 9000 dates. These courses are run by about 275 public and private sector organisations, which include computer and typing schools, but not driving schools.

4. There are currently 60-100 enquiries per day - 20-30 on the telephone and the remainder by the return of cards. The procedure followed is that enquirers complete a card, which is attached to a leaflet about the database. The details of the enquirer and the enquiry are then input to the computer and a printout (on a laser printer) is prepared, together with an individualised letter, which is signed by one of the database's staff. A great deal of information is given both about individual courses and about the range of courses covered by the enquiry. Because of the careful design of the enquiry forms, the computer is able in most cases to match the enquiry with a printout, but human intervention monitors this and also deals with those enquiries which may take rather longer, for example because there is no immediate answer from the computer; in these cases a holding letter is sent to the enquirer. Once the response to the enquiry has been despatched, the name and address of the enquirer are destroyed to comply with data protection requirements. Information on age, sex and subject area are, however, retained to help monitor the whole operation.

5. Almost all the enquiries appear to come from individuals, although in a small minority of cases companies may have given cards to their employees. Cards are also supplied in self-service dispensers in banks. Data-Print also runs a minibus which visits different parts of the City with downloaded sections of their database, chosen for their probable interest to the particular part of the City which is being visited.

6. The information service has had a high local political profile from the beginning. Even more important, however, is the nature of its funding. Now the development period is over, Data-Print is contracted to do a certain amount of work for about 70 000 ecus. If it succeeds in obtaining additional courses or enquiries above the contracted sum it is paid extra for those, and already this year has earned about 40% above the base figure. These sums do not include marketing. There is a separate contract between the Berlin Senate and a public relations company to undertake marketing for this and for other initiatives (although the impression given was that the database was the main beneficiary of this contract). This PR contract is for over 140 000 ecus, i.e. marketing costs are seen as being twice that of basic information service running costs. This marketing will include the distribution of leaflets to 300 000 homes in October, followed by another 300 000 in January and again in April. Each of these leaflet distributions costs about 28 000 ecus (including printing).

7. Because of the high local profile, the newspaper Zweite Hand, a three-times-a-week paper containing solely classified advertising, prints half a page to a page of listings of those courses which are going to start in around a week's time. They also provide a proforma which can be sent to the database. This is a free offering by the paper as a service both to Berlin and to its readers. At present the handling of enquiries is undertaken by three members of staff, who also have other duties The computer selects the courses which are soon to start, and information is sent to the paper by magnetic tape which is fed directly into their typesetting machine.

8. The service is free, both for those who 'advertise' on the database and for enquirers. However, a published document is also available four times a year for about 40 ecus a time (i.e. there is no annual subscription).

9. The enquirers are analysed by age group (see Table E1), and area of enquiry (see Table E2 below for those for which over 500 enquiries had been received by mid-September 1987)

Table E1: Statistical analysis of enquiries accorrding to age and sex

Age Groups	Women	Men	Unknown	Total
0 - 20	722	755	77	1 554
21 - 25	697	655	1	1 353
26 - 30	790	837	0	1 627
31 - 35	475	581	0	1 056
36 - 40	272	316	3	591
41 - 45	198	137	2	337
46 - 50	88	82	2	172
51 - 55	26	26	0	52
56 - 60	3	10	0	3
61 +	1	8	0	9
Total	3 272	3 407	85	6 764
%	48.4	50.4	1.3	

Table E2: Number of enquiries in each category

Note : the categories shown have been confined to specific ones with more than 500 enquiries.

Category	Women	Men	Unknown	Total
Business management	2 874	2 643	79	5 596
Computer processing	1 656	1 867	29	3 552
Software	983	966	41	1 990
Technology	238	1 646	16	1 900
Chamber of commerce courses	907	841	14	1 762
Technical management	605	1 008	24	1 637
Foreign languages	1 039	494	4	1 537
Medicine	1 099	387	12	1 498
Administration	590	568	11	1 169
Programming	266	866	19	1 151
Social services	767	303	12	1 082
Law	363	450	15	828
Ecology	409	402	5	816
Instructors	370	407	12	789
Master craftsmen	70	643	7	720
Psychology	399	282	12	693
Personal computers	340	333	11	684
Examination/diploma courses	178	481	5	664
Media	248	312	0	560
Self-management	202	309	13	524
Sales	222	295	6	523
Total all categories (not only those listed above)	16 754	19 928	431	37 113

Chapter 6: Transfer of information between databases

Introduction

6.1 Although in most countries there is a fragmentation of databases because of the responsibilities of the funding agencies, it is increasingly recognised that clients will often want to access several linked databases at one session. Interest is therefore growing in the transfer of data from one database to another.

On-line communications

6.2 It is theoretically possible for information to be transferred from one database to another on-line, using the public telephone system. However, different computer hardware operating systems and database software often makes this process much more complicated than might be expected. In addition, the cost of using telephone links may make on-line transfer of data between databases unacceptably expensive, and sometimes unreliable.

6.3 None of the national databases examined during the survey were transferring data on-line from one database to another. However, CEDEFOP has an on-line arrangement with the European Space Agency mainframe computer at Frascati in Italy, whereby the training bibliography data being collected in each EEC country can be fed into this computer on-line and will also be capable of being presented on-line. In the UK there is a plan to link the PICKUP and ECCTIS databases on-line for the transfer of data, but this is not to be attempted until the ECCTIS database is run on a different computer system from the present one. Indeed, the on-line link would be a by-product of the change to a new computer system which is required primarily for other purposes.

Off-line communications

6.4 It is possible to move data from the hardware used by one database to another off-line means. For example, the PICKUP data for Prestel is currently sent to ECCTIS on magnetic tape. However, more convenient transfer of information could be by

* microcomputer floppy disc
* CD-ROM
* Softstrip
* WORM (Write once read mostly optical disc - probably imminent)

6.5 During the project GES has taken specimen data on IBM PC format microcomputer discs which worked immediately on PCs in Italy, Germany and the Netherlands. It would be possible without much difficulty to blend the data where appropriate into that held by the other databases. Again, floppy discs from ICON Institute and Vondst BV have been run successfully by GES in England, although again no attempt has yet been made to merge the data with the local database. The flexibility of using the IBM PC standard is illustrated by the occasion when it was more convenient for the GES field worker to meet the representative of SLO in Brussels rather than at Enschede. An office was borrowed with an Olivetti PC (IBM compatible) and the CHOICES disc ran immediately. As microcomputers are frequently used as terminals to mini or mainframe computers, the use of microcomputer discs for transfer of small amounts of data into major databases is feasible.

6.6 An alternative method of transferring data would be by CD-ROM, with the CD-ROM drive being used as a computer peripheral. Again, GES has taken a CD-ROM player to Bologna and connected it with a Dioikema IBM PC in order to give a demonstration at a time before CD-ROM drives became available in Italy. The PC works in conjunction with the CD-ROM drive, and the software can appear to blend data from hard disc, floppy disc or compact disc without the user having to worry about the source of the data. There is potential here again for transferring very large amounts of data from one access point to another, or possibly from one main database to another, if this were necessary.

The next stage is for data from different databases in different countries to be included on the same compact disc. Already in the UK, ECCTIS, MARIS-NET and PICKUP data are being pressed on a single experimental compact disc.

6.7 Early in 1988 IBM is expected to market a WORM (Write once read mostly) drive which will work with existing IBM PCs; drives are already available for the new generation of IBM microcomputers. These drives are likely to be priced at about 4250 ecus and will take a 200 megabyte cartridge which will cost approximately 100 ecus. These cartridges could become another means of communicating between databases. Because of their much greater material cost than CD-ROM, they are unlikely to be as acceptable as a means of mass access but may prove more useful for transfer of data between database operators (because they can be produced in-house without the need for pressing by a manufacturer).

6.8 Eventually a combination of off-line transfer systems might be appropriate:

* CD-ROM for very large amounts of stable data, where sufficient users exist to make it worthwhile to master and press the disc.

* WORMs for large amounts of fairly stable data for a limited number of users.

* Microcomputer discs or Softstrip (see paragraph 4.31) to provide rapid updates or local adaptations to data on CD-ROM and/or WORM.

Seamlessness

6.9 Where different databases are included at the same access point in such a way that they can be searched by a client or advisor, it makes sense for the user to be able to find what he or she wants without having to know which database is being accessed. It should be possible to create situations in which the user can move from one database to another without having to come out of the first database and then re-enter the second. The MSC TAP initiative is attempting to provide information from ECCTIS, MARIS and PICKUP at the same access points, and to add local databases as well. As noted in paragraph 4.25, TAP has commissioned from Logica Ltd a 'smart database searcher' which would enable the user to search in this way. This is becoming extremely complex and is requiring a careful analysis of the different thesauruses used by the three databases.

A much more straightforward system, although still capable of improvement, is being provided by the software for the CD-ROM, on which all three databases are being held. The enormous capacity of the CD-ROM for the first time makes it feasible to place many databases side by side with plenty of space left over for indexes, thesauruses and even software (once it is finalised).

6.10 Mere proximity - several databases on the same side of a compact disc - in itself guarantees nothing, but it opens the door to software approaches that would never have been attempted while databases were housed in distinct and distant mainframes.

As a first step, a menu program can offer the user a choice of which database to search - a simple device that makes the difference between them seem smaller than they are. The second step is to adapt the search software for each database to make the process of interrogating them more similar and familiar-seeming for the user; even if the search criteria are difficult to reconcile, it is surprising how great an effect can be achieved by a common policy on such matters as how to highlight a selection from a menu, whether ENTER/RETURN must be pressed before a choice is executed, how to undo a decision and how to move between records. (Equally, it is astonishing how much user frustration and time-wasting is created by different conventions on such matters).

6.11 A further step is to harmonise the search criteria and move towards a common system of indexing and vocabulary of terms. Although full integration is an impossible dream (unless the databases are astonishingly similar in their scope and purpose in any case) it is relatively easy to add extra indexing words, to create look-up tables for equivalent terms; in principle, it is easy also to create another version of the whole database and software in another language - though the skilled manpower costs involved in such an exercise should not be under-estimated. All this and much more can be achieved on a single CD-ROM; practitioners may need time fully to grasp the potential for making their databases more comprehensive, more international and - above all - easier to use.

Language barriers

6.12 The different Community languages may cause problems in transferring data between databases in the different countries. These problems are of two types:

* inexactitude of translation

* the use of accents and, in the case of Greek, a different script.

6.13 The inexactitude of translation (for example 'education' in English is either 'education' or 'enseignment' in French) can cause conceptual difficulties which may make it harder to obtain the correct data if it is transferred and translated from one language to another. This is particularly so when a word in one language has a secondary meaning which the equivalent word in another language lacks. An example is 'abort', the secondary meaning of which in English has lost all its original medical connotation of spontaneous stillbirth but which, when used in in a computer context in French grates, because there is no equivalent secondary meaning.

6.14 CEDEFOP has a multi-lingual thesaurus which gives the equivalent terms in most of the Community languages, but this in itself does not help explain what all the meanings are. The FernUniversitat has a research worker who is creating a glossary of distance learning terms in German, French, English and Spanish, with sentences to illustrate the different contextual usage in each language. If vocational education and training data is to be transferred across the language barriers an expanded glossary (perhaps on a compact disc) covering the whole field and additional languages would be worth commissioning.

6.15 Another approach would be to transfer the data in the original language. Problems could arise here when that original language uses accents. The failure to use an accent correctly normally counts as a mis-spelling of a word, and where that word is a keyword could lead to a failure to find the record to which it is attached. It would seem perfectly feasible to create a sort of spellchecker computer program which would enable searches to be made not only on unaccentuated vowels but also on those which might carry an accent. Indeed, further exploration might well discover commercially available programs which do just this. As the databases are constructed, however, transfer of data in accentuated languages to systems working without accents is likely to be difficult, although the contrary would not apply.

6.16 A further problem relates to differences in language length (and hence screen space and storage requirements) when data is transferred from one database to another - even if a common record structure can be agreed. Rough estimates provided by the University of Ulster suggest that if English is taken as one unit, then the equivalent space requirements are:

Danish:	0.8
Italian:	1.0
French:	1.3
Dutch and German:	1.2-1.4
Spanish and Portugese:	1.5

6.17 None of these problems are insuperable, but they will need to be solved if there is to be any widespread trans-national exchange of data.

Chapter 7: An EEC strategy for databases in vocational education and training

The case for a strategy

7.1 The main interest and markets for databases are within the countries in which they have been established. The funding of databases by national government departments or agencies is unlikely to give much, if any, priority to multi-national transactions. Even if databases can become self-funding, their financial margins are likely to be so tight that they will have difficulty in supporting contacts with databases in other countries. Some outside source which promotes contacts between databases will therefore be necessary, and the EEC can only be expected to provide the required funding if such contacts fit in with an overall EEC strategy.

7.2 It is suggested that such a strategy should have four aspects:

* use of databases for research and decision-making
* exchange of data
* exchange of experience.
* co-ordination/convergence

Research and decision-making

7.3 As has already been noted in Chapter 5, there is a wealth of data in the national databases throughout Europe which could be harnessed for research and decision-making on vocational education and training throughout the EEC. One particular field in which databases could be used as a tool is the equivalence of qualifications or other requirements to practise a profession. As many countries as possible could contribute to an EEC database containing standardised information on qualifications in different fields. This could provide a possible short-cut to the multi-national discussions which are taking place on the recognition of qualifications. It is likely that many databases already hold this information, perhaps more than is actually required; as has already been noted, selections can be made from information stored. A useful EEC project could identify what is immediately available. Subsequent projects under one of the main EEC initiatives could encourage any gaps to be filled, determine a common structure and arrange for suitable databases to feed into the appropriate research or decision-making offices.

Exchange of data

7.4 Information on opportunities in vocational education and training could be useful in the following ways:

* Encouraging the movement of students (including those on specialised short courses e.g. for technology transfer) from one country to another.

* Identification of the equivalences of qualifications between countries together with information on what is needed to bridge non-equivalent qualifications and where courses for such bridges might be obtained.

* Identification of entry requirements for graduate and post-graduate courses, and perhaps for those at higher technician level, across the whole of Europe, including the ability to answer the question 'I have such-and-such a qualification, where can I go for further study?'.

7.5 Such data might be exchanged on-line, or by electronic mail, or off-line on paper, but the electronic means of communicating off-line between databases (see paragraphs 6.4-6.8) probably offers the best prospects. There is a case, therefore, for an analysis of needs, of how those needs could easily be met and what gaps need to be filled; probably the equivalence of qualifications will prove to be the most urgent gap.

7.6 The problems of transferring data in different languages have been touched on in paragraphs 6.12-6.17. Work will be needed to overcome such problems, and especially to see how databases in Greek script could be transferred to other languages, if there is to be a general flow of data across the Members of the EEC. As this work is unlikely to be high priority for any individual country or database, it would seem an appropriate area for Community intervention and support.

7.7 The EEC might also take a lead in a trans-national approach to the classification and indexing of data for ease of search. Clearly, the classical approach to thesauruses is not going to be adopted where database operators see many administrative problems for a small pay-off, because the international market is perceived as far less important than the national. But database operators in the Netherlands, West Germany and the UK are developing practical, pragmatic solutions to these problems, and indeed similar solutions have been arrived at quite independently in different countries. There is an area here for trans-national action research which would benefit the whole EEC.

Exchange of experience

7.8 Earlier contact between Dioikema, Centre Inffo and the British databases has shown how much the various database operators can learn from each other. This report itself has drawn on the experience of a large number of database operators, who showed great enthusiasm for breaking down the present isolation of databases. We have found that virtually every database operator has something to teach and certainly every sponsor and operator has something to learn.

7.9 Continuation of contacts between database operators would provide a means of enabling all the countries in the EEC to share expertise and experience and to exploit to the full advances in information technology. At the same time mechanisms for exchanging experience will almost certainly lead to the exchange of data itself to becoming easier.

7.10 Three mechanisms are suggested:

* occasional conferences; it is hoped that one will be held at which this report will be represented.

* the development of an electronic communication network (see below).

* a modified Club D (paragraph 1.3), which would enable any type of organisation concerned with vocational education and training databases to take part, with special interest groups for individuals;

7.11 Electronic communications offer various possibilities, of which the most obvious is electronic mail and messaaging; given the difficulties of two busy people coinciding in access to a telephone line (accentuated by differences in time zones and working hours), the way in which poor acoustic quality and language problems multiply difficulties in conversation and the slowness of postal mail

between some EEC countries, there are many attractions in the prompt and relatively cheap exchange of messages at times of the caller's choosing. Another useful medium is computer conferencing on particular themes: participants do not meet, but over a pre-arranged period of weeks or months exchange text messages and comments on messages. Any participant can log on at any time, reading or adding to the discussion as it builds up. Other possibilities include the provision of news and abstracts relevant to database practitioners, an up-to-date multilingual glossary and so on.

7.12 If the 'club' attracted membership of organisations and individuals and provided a good service (including the electronic communication network), joining it would be so much in the interest of anyone running (or planning to run) a vocational education database that a reasonably comprehensive register could be created and maintained.

Co-ordination/convergence

7.13 The above paragraphs are based on the position at the time of writing the report, when the various vocational education and training databases are almost entirely internal to the member states of the EEC. At the end of this report it is worth looking ahead.

7.14 As barriers to trade between the EEC states are removed and a genuine trans-national system of industry, commerce and flow of personnel emerges, there will be an increasing need for co-ordination and indeed convergence of vocational education and training. There are many steps on the road, but in the meantime a greater co-ordination, and later convergence, of information about training, would enable people to take up training opportunities throughout the EEC, even though those opportunities themselves had not been fully harmonised.

7.15 There is a case, therefore, for systematic development to achieve convergence of training information as early as possible , using the national databases as a means of delivery. There would be benefits:

* to users: who could search more data, giving more comprehensive coverage, more quickly and easily

* to information providers: who could offer a more comprehensive service to a larger market, e.g. making it be easier to achieve viable subscriptions.

* to the decision-makers: who would thereby gain access to a comprehensive map of training opportunities throughout the EEC.

7.16 At the beginning of the project such ideas might have seemed to be an ideal beyond the horizon. However, the enthusiasm of the database operators for further collaboration makes such aims achievable. Indeed, partly as a result of the contacts made during this project, some of the database operators are already collaborating in joint proposals to the EEC SPRINT programme for trans-national databases in the fields of innovation and technology transfer, with an eye to the involvment of other operators if the projects are successful. This spontaneous development from the practitioners suggests that quite modest funding could have a disproportionate impact in achieving a comprehensive and coherent European information system on vocational education and training.

October 1987

Appendix 1: Databases and other organisations visited or studied

A. Fieldwork

Note: initials of field workers are as follows

CD: Claudio Dondi, then of Dioikema
LI: Lilia Infelise of Dioikema
IL: Ian Laughton of MARIS-NET
AM: Tony McCormack of MARIS-NET
JM: Jacquetta Megarry for GES
JT: John Twining of GES

5 June	OEI Madrid: Dr M J Garcia Sipido	(CD)
	FUNDESCO, Madrid: Mr S Ortiz Chaparro	(CD)
8 June	INEM, Madrid: Mr J M Madrid, Mr E Retuerto De La Torre, Mrs M L De Las Cuevas	(CD)
	Department of Education and Science, Madrid: Dr I Fernandez Flores	(CD)
15 July	FernUniversitat, Hagen, West Germany: Professor B Holmberg	(JPT)
16 July	Bundesministerium fur Bildung und Wissenschaft, Bonn: Professor Hasemann	(JM, JPT)
	Deutsche Stiftung fur internationale Entwickling (DSE), Bonn: Dr D Dankwortt	(JPT)
	Standingen Konferenze des Kulturminster der Lander, Bonn: Dr Konrad	(JM)
17 July	ICON Institut, Koln: Mr H-G Luban	(JM, JPT)
20 July	Vondst BV, Heerlen, Netherlands: Mr A H De Jong, Dr A Torben-Nielsen	(JPT)
4 August	University of Leiden, Netherlands: Mrs G Loe	(JM, JPT)
5 August	IBO, Rijswyk: Mr A T Nieuwland	(JM, JPT)
6 August	CEDEO, The Hague: Mr H P Bruin	(JPT)
26 August	Service d'Information sur les Etudes et les Professions (SIEP) Brussels: Mr P Pluymackers	(JM, JPT)
	Centre de documentation et d'information interuniversitaire en sciences sociales (CENDIS), Brussels: Mr D Liegeois	(JM, JPT)

27 August	ATHENA, Brussels: Mr J C Kech	(JM)
	Centre D'Information et de Documentation Sur les Etudes et Les Professions (CID), Catholic University of Louvain-la-Neuve: Mr J M Burnet	(JPT)
	Office National de l'Emploi (ONEM): Mr Wiele, Mr J-P Grandjean	(JPT)
28 August	Meeting in Brussels with Mr F Spoek of Netherlands National Institute for Curriculum Development (SLO)	(JPT)
15 September	Bundesinstitut fur Berufsbildung (BIBB), Berlin: Mr C Wehner	(JPT)
	Weiterbildungsdatenbank, Data-Print GmbH, Berlin: Mrs Luszeit, Mr B Bottcher, Mr F Van Kekule	(JPT)
16 September	Wissenschaftszentrum fur Sozial Forschung (WZB), Berlin: Dr B Reissert	(JPT)
	CEDEFOP, Berlin: Presentation of study to Documentary Information Network	(CD,LI,JPT)
17/18 September	Bundesanstalt fur Arbeit, Nuremburg: Dr Stothfang	(CD, LI)
22 September	Rijswyk, Netherlands Demonstration of IBO : Mr A T Nieuwland ISEE : Mr B Van Amstel, Dr H M Pere	(JPT)
28/29 September	Dublin: AnCO - the Industrial Training Authority: Ms M O'Donnell, Mr A Maloney, Mr S Kearney Mr E Durkin.	(AM)
	Department of Labour: Mr M O'Hearn, Ms M Pine and D Kelly.	(AM)
	Council for Education, Recruitment and Training for the Hotel and Catering Industry (CERT): Ms P Reed, Mr T Baum	(AM)

B. Other visits made (*= partly connected with project)

5 May	Bologna: Dioikema (IL, JPT - meeting also involved CD, LI)*
18 June	Paris: Centre Inffo (JPT) *
8 July	Birmingham (CD - meeting also involved AM, JM, JPT)*
9-11 September	Bologna: Dioikema (JM and JPT - meeting also involved CD, LI)

C. 'Home Ground' Databases and other written information

Belgium	Centre for Andragogic Research, Brussels
France	Centre Inffo
Great Britain	ECCTIS MARIS-NET PICKUP Training Directory Further Education Curriculum Database Training Grants database MicroDOORS TAP local databases ResCue (NERIS) Further Education CAL database
Greece	(included in Part 2 of the report only)
Italy	Biblioteca di Documentazione Pedagogica (BDP) Dioikema Noopolis

Appendix 2: EEC currency equivalences as at July 1987

In this report all amounts are expressed in ecus

	Value of 1 ecu
BFB/LFR	43
DKR	7.8
DM	2.1
DRA	156
PTA	143
FF	6.9
IRL	0.77
LIT	1500
HFL	2.33
ESC	162
UKL	0.71

Notes

1. Source: SPRINT call for proposals
2. All figures approximate.

Appendix 3: Expansion of acronyms and glossary

ACTFOR
Activadados Formativas: Spanish database designed and distributed by IMPI (Instituto de la Pequena y Mediana Empresa Industrial); concerned with entrepreneurial training activities.

AnCO
Ireland's industrial training authority.

ANPE
Agence Nationale pour L'Emploi: French national employmment agency

artificial intelligence
Capability of some computer software to interact with humans and guide their decision-making with apparant intelligence, often coupled with the capability to 'learn' from experience, e.g. programs which respond to what the users mean as opposed to tha characters which they key in.

Asean
Association of South East Asian Nations.

Athena
A non-profit association created in Brussels in 1984 with backing from various government ministries, aimed at co-ordinating organisations and networks concerned with technological developments and their economic consequences. Athena publishes a monthly magazine Bulletin Athena (in French and German).

Athenatel
Athena Technologies-Education
Tele-information: menu-driven videotex system being developed by Athena to provide vocational information on new technology, including electronic messaging and a glossary of terms.

BASIS
A database software product intermediate between a retrieval language and a database management system, as used by the Dioikema information system among others.

BIDE
Banco Iberoamerican de Datos de Educacion: database from OEI on courses and grants at post-university level in Spanish-American countries. Distribution is entrusted to the Spanish Ministry of Education and Science.

Boolean
Type of searching in which enquiries used logical expressions such as 'and', 'or' and 'not'.

BTS
Brevet de Technician Superieur: higher technician diploma in France.

BTX
Bildschirmtext: the viewdata (interactive videotex) system developed in West Germany.

Bundesanstalt fur Arbeit
Nuremberg-based national employment agency for West Germany.

byte
Unit of computer storage sufficient to store a single character; eight bits.

C
High-level computer language associated with Unix operating system; software in C is highly transportable.

CCI
Chambre de Commerce et d'Industrie: French chamber of commerce and industry.

CD
Short for compact disc; 12cm in diameter, it can store up to 74 minutes of high-fidelity sound in digital audio format. Resembles a gramophone record, rather than an audiocassette, in that it can be played but not erased - the computer equivalent of 'read' but not 'written'.

CD-ROM
Compact disc read only memory; optical disc (same size as an audio compact disc) used to distribute digital data. Users can 'read' but not 'write to' the disc. Each CD-ROM can store around 600 megabytes so that large databases, indexes and software can co-exist on a single disc.

CEDEFOP
Centre european pour le developpement de la formation professionelle. The European centre for the development of vocational training in Berlin.

CEDEO
Stichting Centrum voor Documentatie en Voorlichting over Bedrijfsexterne Opleidingen: foundation in the Hague that collects and disseminates information on business courses. Self-financing from sale of surveys and on-line database subscriptions.

CENDIS
Centre de documentation et d'information interuniversitaire en sciences sociales: a bibliographic database held at the Unviersite Libre de Bruxelles.

Centre Inffo
Centre for the development of information about continuing education and training: a French non-profit association funded by government whose aim is to develop information, documentation and research about vocational training.

CERT
Council for Education, Recruitment and Training for hotel and catering industry in Ireland.

CHOICES
Canadian careers guidance software intended for self-service use; the European agent is SLO at Enschede.

CID
Centre d'information et de documentation sur les etudes et les professions: Belgian centre for information and documentaion on courses and professions based at the Catholic University of Louvain-la-Neuve.

CIO
Centres d'Information et d'Orientation: centres of information and guidance in France.

Closed user group
A group of subscribers to a viewdata system who can access public pages and can also exchange private messages.

COM
Computer output microform; text held on a computerised database can automatically be output to microfilm or microfiche.

Datacast
Proprietary name of the British Broadcasting Corporation's data broadcasting system; the system requires a decoder and resembles teletext except that data is secure and private, not publicly available.

Data-Print GmbH
A private sector software house in Berlin, which operates the Weiterbildungsdatenbank for the Berlin Senate.

dBase III
Sophisticated database software with built-in programming language; distributed by Ashton-Tate Inc.

DES
Department of Education and Science; government department with responsibility for education in England.

Dioikema
An Italian 'centre of services' for education and training, supported by national and regional authorities; the company is closely linked with a non-profit association which owns the database that Dioikema runs.

DSE
Deutsche Stiftung fur internationale Entwicklung: foundation for international development in West Germany with headquarters in Berlin. Its Bonn office holds extensive documentation about developing countries and an up-to-date list of organisations.

ECCTIS
Educational Counselling and Credit Transfer Information Service; based at the Open University, ECCTIS operates a major UK database with details of all long courses leading to qualifications. It also operates an up-to-date vacancy service for degree courses.

ecu
European currency unit, see Appendix 2.

EEC
European Economic Community

expert system
Software that builds up expertise in making judgements and displays artificial intelligence. Some expert systems can converse with humans in a relatively natural way, and some can explain and justify their line of 'reasoning'. So far, the most successful ones tend to operate in a restricted field of knowlege; they are sometimes called (Intelligent) Knowledge Based Expert Systems (IKBES or KBES).

FAF
Fond d'Assurance Formation: Foundation for insurance training in France.

FernUniversitat
Distance teaching university in Hagen, West Germany which maintains a database on international bibliographic information on distance learning.

FEU
Further Education Unit; a post-school curriculum development agency with government funding and responsibility for England and Wales.

FONGECIF
Fond de Gestion de Conge Individuel de Formation: Foundation for management of individual leave for training.

FUINCA
Fundacion para el Fomento de la Informacion Automatizada: private organisation founded in 1979 with the aim of disseminating information on Spanish databases in all areas; publishes a Catalogue of Spanish Databases which is already in its fourth edition.

FUNDESCO
Fundacion para el Desarrollo de la Funcion Social de las Comunicaciones: foundation about the social function of communication.

field
A single item of information on a database; each record contains a number of fields.

gateway
A link that allows viewdata users access to external computers and their databases.

GES
Guildford Educational Services Ltd, a UK-based company with expertise in the field of education and training, which operates the PICKUP Training Directory and other databases on training grants, vocational qualifications and statistics on work-related NAFE.

IBM PC
16-bit range of personal computers made by IBM which has become an industry standard; a large number of very similar and compatible machines have been produced by other manufacturers, known as IBM-compatibles or PC clones.

IBO
Informatiecentrum Beroepen en Opleidingen. The database/information service of the Netherlands Ministry of Social Affairs and Employment.

ICON Institut
A Koln-based consultancy mainly concerned with third world developments; operates a database on advanced training in the EEC for Asean graduates and professional covering engineering, informatics and management.

ICYT
Instituto de Informacion y Documentacion en Ciencia y Tecnologie: Institute of CSIC (Consejo Superior de Investigaciones Cientificas); produces and distributes a database on Spanish scientific publications.

INEM
Instituto Nacional de Empleo: Institute of Ministry of Labour and Social Security, which develops services regarding placing, guidance and professional training in Spain. Derived from a basis of printed information on audiovisual teaching material relevant to professional training in diverse areas. It is creating an archive of courses.

I-SEE
The pilot delivery system for a series of education and training databases in the Netherlands, initially concentrating on careers exploration.

ISOC
Instituto de Informacion y Documentacion en Cie... Sociales y Humanidades: an arm of CSIC (Consejo Superior de Investigaciones Cientificas), which manages a series of databases, respectively juridical (ISOC-DR), economic (ISOC-EC) geographic/historical (ISOC-HU), and scientific (ISOC-ID). The information is distributed by the Spanish Ministry of Education and Science.

keyword
Some databases can be researched by keywords that 'unlock' their contents; each item is known to the system by a number of keywords that convey the gist of what they are about.

kilobyte
Approximately one thousand bytes; sufficient to store around 150 words of (English) text.

LEDA
Juridical database of the Spanish Ministry of Education and Science.

Logica Ltd
British software company, developing a 'smart database searcher' for TAP.

MARIS
Materials and Resources Information Service based at MARIS-NET Ely, which since July 1987 has been a private company. Provides on-line information for training.

Medienbank
A database containing 8000 records of training materials; operated by BIBB of Berlin.

megabyte
Approximately 1000 kilobytes or around a million bytes; sufficient to store around 150 000 words of (English) text.

microDOORS
Interactive careers software with a database of occupations, produced by the Careers and Occupational Information Centre (COIC) of the Manpower Services Commission.

microfiche
Rectangle of film carrying minute photographic images of text or drawings; each microfiche can hold from 60 to 300 pages depending on the reduction factor.

Minitel
Small videotex terminal supplied free to householders by the Mitterand government primarily as a directory enquiry service but with the ability to connect users directly with Information Providers and to provide electronic messaging. Around three million terminals have been installed.

MSC
Manpower Services Commission: a UK government agency with wide responsibilities and a large budget for manpower planning and training; recently involved increasingly with education.

MS-DOS
Microsoft disc operating system: the most popular 16-bit mcirocomputer operating system, as commissioned by IBM for its PC (on which it is known as PC-DOS).

NAFE
Non-advanced further education.

NCVQ
National Council for Vocational Qualifications - UK body established in 1986 responsible for designing a coherent system of work-related qualifications.

NERIS
The UK national educational resources information service databse of materials for teachers; accessible through videotex systems such as Prestel and TTNS.

OEI
Organizacion de Estados Iberoamericanos para la Educacion, la Ciencia y la Cultura: international organisation for co-operation between Spanish-American countries in the fields of education, science and culture; produces the BIDE database.

ONEM
Office National de l'Emploi: a francophone government department based in Brussels.

Open Tech
A programme of the MSC (now completed) for funding the development of Open Learning.

PA Consultants Ltd
International and independent management and technology consulting group founded in 1943.

PAIO
Permanence d'Accueil d'Information et d'Orientation.

PC
Personal computer: microcomputer intended for one user at a time. Sometimes refers to the IBM range of Personal Computers and compatible machines from other manufacturers.

PICKUP
Professional Industrial and Commercial Up-dating programme of the Department of Education and Science for England.

The Planning Exchange
Glasgow-based agency that provides specialised information in a number of fields, including government grants for the UK.

Prestel
UK viewdata system with around 300 000 pages of information in page format; subscribers can interact with the system, and can interrogate other databases (such as ECCTIS and NERIS) through gateway links.

PTT
Posts Telephone and Telegraph; general term for national agency for communication services used by the public.

RAM
Random access memory; internal memory used to store programs and data in active use.

Record
Each file in a database consists of a number of records, each containing a number of fields of information.

ResCue
UK electronic network available to all TTNS subscribers, designed for teachers and advisers in pre-vocational education and for employers engaged in education and training. It was developed by the Northern Ireland Regional Curriculum base and has been supported by the FEU.

SDS
Scottish Data Services: a proposed organisation to co-ordinate and disseminate a comprehensive vocational education and training database for Scotland.

SIEP
Service d'information sur les etudes et les professions: database on professions and courses at all levels for francophone Belgians. Accessible to public enquiries and based in Brussels.

SLO
The Dutch institute for curriculum development based at Enschede.

SMEs
Small and medium sized enterprises.

Softstrip
Machine-readable printed strip, somewhat like a fine-grain bar code.

TAP
Training Access Points, an initiative of the UK Manpower Services Commission to make training information more accessible to the public.

thesaurus
Dictionary of keywords in a database, showing related terms, synonyms and other relationships.

TTNS
The Times Network for Schools: electronic communications and information service designed for educational users. It includes databases, electronic mail, local news and noticeboards, and gives access to the ResCue service.

UNESCO
United Nations Educational Scientific and Cultural Organisation.

Unix
A sophisticated operating system for 16-bit microcomputers that allows multiple users and multi-tasking.

VET
Vocational education and training.

videotex
Electronic methods of receiving information from a distance and displaying it on a screen. One-way (broadcast) videotex is also known as teletext, whereas two-way (interactive) videotex is sometimes called viewdata.

VONDST
Dutch commercial careers guidance program.

Vondst BV
Careers consultancy in the Netherlands; designers of VONDST.

Weiterbildungsdatenbank
A database on short courses run for the Berlin Senate by Data-Print GmbH.

WORM
Write once read mostly; type of optical disc, typically with 200 megabytes capacity, which allows users to 'write' (record) information once only. WORM discs are mainly used for reading information (contrast read only media such as CD-ROM); a WORM drive is available on the top model in the IBM PS/2 range (the successor to its PC range).

WZB
Wissenschaftszentrum: a Berlin-based research institute in the field of training.

CEDEFOP — European Centre for the Development of Vocational Training

Data bases in vocational education and training

The European scene

Report of a study carried out by Club D with funding from the European Commission (DG V), Manpower Services Commission, UK, Ministro del Lavoro, Italy

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